AUTHOR INDEX

A

Abell, G. O., 366
Abetti, G., 155
Ables, H. D., 10
Acton, L. W., 385, 388, 389
Adam, M. G., 149, 151
Adams, D. J., 377
Adgie, R. L., 343, 345
Afanasyeva, V., 128
Ahluwalia, H. S., 83, 111
Aitken, D. W., 399
Alfvén, H., 82, 156, 277, 291, 316
Allen, C. W., 289, 402
Allen, L. R., 26, 27, 28, 30, 329, 341, 346
Allen, R. J., 326, 424, 426, 427, 430, 434, 438, 441
Aller, H. D., 426, 431, 439
Aller, L. H., 8, 42, 46, 52, 58, 69, 71, 73, 226, 367
Alpher, R. A., 196, 197
Altenhoff, W., 326, 426, 429
Altschuler, M. D., 162
Amano, T., 171
Amazeen, P. C., 84
Anderson, A. E., 1, 6
Anderson, B., 343, 346, 347
Andrillat, Y., 52, 57
Anger, C. J., 48
Antoniadi, E. M., 288
Antrack, D., 281
Arnett, W. D., 369
Arpigny, C., 267
Asbridge, J. R., 86, 87, 108, 111, 271
Ashkin, J., 204
Auer, L. H., 369
Augarde, R., 1
Axford, W. I., 84, 272, 277

B

Baars, J. W. M., 327, 420
Babcock, H. D., 124
Babcock, H. W., 83, 124, 133
Baglin, A., 368
Bahcall, J. N., 206, 456
Bahng, J., 231
Bailey, J. A., 255, 418
Baldwin, J. E., 322
Bame, S. J., 86, 87, 108, 111, 271
Bappu, M. K. V., 48, 70, 71, 72
Barber, D., 290, 432, 438
Bare, C., 432
Barnard, E. E., 216
Barrett, A. H., 288, 326, 417, 424, 426, 427, 430, 434, 438, 441
Bartels, J., 81
Bartlett, F., 424
Barton, R., 47
Baselyan, L. L., 322
Basu, D., 133
Bates, D. R., 232, 233, 473, 483
Batey, P. H., 1
Baum, W. A., 1, 2, 3, 8, 10
Beals, C. S., 39, 40, 57, 67, 69
Beard, D. B., 278
Beavers, W., 21
Becker, W., 168
Beckers, J. M., 136, 137, 151, 153, 154, 159
Becklin, E. E., 428
Bednařova-Nováková, B., 128
Beenakker, J. J. M., 233
Bell, B., 132
Bell, K. L., 378, 380
Bell, S. J., 417, 418
Bellier, M., 10
Belton, M. J. S., 270, 271, 273, 279, 281, 284, 285
Bely, F., 488
Bely, O., 488
Bennett, A. S., 249, 325, 327, 335
Bergamini, R., 263, 338
Berge, G. L., 167, 290
Berger, R. A., 488
Bergstralk, J. T., 10
Berkuisen, E., 420
Bernstein, I. B., 184
Beron, B. L., 399
Berry, A., 289
Bertola, F., 47
Bessel, F. W., 279
Bethe, H. A., 196, 204
Beyer, M., 280
Bezrukikh, V. V., 83
Bieger-Smith, G. P., 165
Biermann, L., 81, 160, 186, 187, 268, 270, 275, 276, 277, 278, 279, 281
Bigeon, M. C., 492
Bird, G. R., 409
Birks, J. B., 399
Blaauw, A., 183
Blake, R. L., 408
Blancho, V. M., 231
Bleeker, J. A. M., 399
Bless, R. C., 51, 57, 65, 71, 73, 74
Bobrovnikoff, N. T., 267, 269
Bockasten, K., 42
Boggess, A., 218
Boldt, E., 399
Bologna, J. M., 188, 420, 440
Bolton, J. G., 250, 252, 253, 255, 324, 335, 433
Bondi, H., 199
Bonetti, A., 83
Borgman, J., 218, 235
Borowitz, S., 465
Bott, J. F., 487
Boussuye, C., 10
Bowen, I. S., 7, 69, 491
Bowyer, S., 376, 381, 386, 392, 396, 398
Boyce, P. B., 10
Boyer, Ch., 289
Braccesi, A., 252, 255
Bracewell, R., 132
Brackmann, R. T., 208
Bradt, H., 376, 377, 388, 390, 391, 392, 402, 413
BRANDT, J. C., 267-86; 86, 270, 271, 272, 273, 279, 281
Braude, S. Ja., 322
Bray, R. J., 116, 118, 119, 135, 136, 137, 138, 148, 149, 158
Bridge, H. S., 83, 87, 92
Bridle, A. H., 257, 322, 333
Brosowski, B., 277, 278
Broten, N. W., 343, 344, 346
BROWN, R. HANBURY, 13-38; 23, 24, 26, 27, 28, 30
Brown, W. B., 465
Browne, A., 26
Broxon, J. W., 151
Brückner, G., 156
Bryant, D. A., 96
Bues, I., 354, 357, 358
Bumba, V., 117, 119, 122, 124, 127, 138, 147, 149, 150, 151, 153, 154
Burbidge, E. M., 9, 249, 260,

346, 413, 430, 432, 441
Burbidge, G. R., 197, 208, 209, 258, 259, 260, 343, 432, 439, 441, 443
Burger, J. J., 399
Burlaga, L., 101, 102, 106, 107, 108, 109, 110
Burnham, R., Jr., 352
Burns, J., 3
Burton, W. B., 165
Burton, W. M., 487
Butslov, M. M., 9
Byram, E. T., 376, 377, 386, 388, 389, 392, 398

C

Cahill, L. J., 84
Cameron, A. G. W., 197, 315
Campbell, C. T., 47
Cannon, R. D., 428, 429, 430, 432
Cantarano, S. G., 90, 105, 107
Carpenter, R. L., 288
Carr, T. D., 315
Carter, A. W. L., 420
Caswell, J. L., 255, 325, 335, 423
Ceccarelli, M., 251, 252, 255
Ceplecha, Z., 281, 282, 283
Chamberlain, J. W., 82, 275
Chandrasekhar, S., 67, 160, 162, 166
Chapman, C. R., 288
Chapman, S., 80, 82
Charles, M. W., 395
Chauser, J. F., 8
Chertoprud, V. E., 431
Chin, C. W., 365
Chincarini, G., 8
Chisholm, R. M., 343, 344, 346
Chitre, S. M., 157
Chiu, H. Y., 365, 367, 369
Chodil, G., 377
Chubb, T. A., 376, 377, 386, 388, 389, 392, 398, 399, 408
Chuvaev, K. K., 9
Ciatti, F., 47
Ciuria, T., 430, 431, 432
Clark, B. G., 165, 169, 174, 259, 343, 431, 432, 440
Clark, G., 373, 383, 399
Clark, G. W., 399
Clark, T. A., 322
Clarke, R. W., 251, 252, 343, 344, 346
Clauser, F. H., 262
Cline, T. L., 96
Coates, P. B., 487
Code, A. D., 51, 57, 65, 71, 73, 74, 221
Cohen, M. H., 259, 343, 344, 417, 432, 440, 464, 465, 485
Colburn, D. S., 107, 110
Cole, D. J., 253, 255, 324
Cole, T. W., 417, 418
Coleman, P. J., Jr., 98, 101, 105, 106, 110, 124, 127
Colgate, S. A., 369
Collins, R. A., 255, 325, 335, 417, 418
Colombo, G., 288, 298, 300
Constantinides, E. R., 464
Conway, R. G., 255, 323, 324, 335, 346
Cooke, B. A., 377, 395
Cooke, D. J., 417, 418
Coppi, B., 277
Corben, H. C., 279
Corcoran, W. H., 487
Costain, C. H., 322
Cousins, A. W. J., 33, 34
Cowley, A. P., 9
Cowling, T. G., 156, 162, 182
Cox, J. P., 367, 369
Coyne, G. V., 224, 227, 228
Craddock, W., 399, 400
Cronyn, W. M., 322
Crowther, J. H., 252, 343, 346
Crowther, P. P., 424, 426, 427, 430, 434, 438, 441
Cruikshank, D. P., 288
Curran, S. C., 393
Czyzak, S. J., 488

D

Dalgarno, A., 204, 465, 467, 468, 470, 485, 492
Damgaard, A., 473, 483
Danielson, L., 279
Danielson, R. E., 136, 137, 159, 160, 162, 218, 219
Danjon, A., 288
Darwin, G., 291, 294, 298
Das Gupta, M., 133
Davidson, W., 262
Davies, J. G., 418
Davies, M., 262
Davies, R. D., 167, 170, 205
Davis, J., 26, 27, 28, 30
Davis, L., 86, 111
Davis, L., Jr., 86, 98, 101, 106, 110, 111, 127, 238, 240
Davis, M. M., 326
Dawe, J. A., 487, 489
Day, G. A., 253, 255, 324
d'Azambuja, M., 122
Deerenberg, A. J. M., 399
Deinzer, W., 157, 158, 159, 368
de Jager, C., 160
De Jong, M. L., 429
Demers, S., 47, 48
Demoulin, M. H., 413
Dent, W. A., 327, 330, 424, 427, 428, 430, 431, 432, 438, 439, 440, 441, 442
Desai, U. D., 96
Dessler, A. J., 82, 83, 90, 93, 111, 272, 281
Dezső, L., 119, 122
Dibai, E. A., 10, 180, 432
Dicke, R. H., 86, 197
Dickel, J. R., 252
Dieter, N. H., 174, 183, 417
Dodson, H., 122, 132
Doe, L. A., 6
Dolfus, A., 288
Dolon, P. J., 7
Donaldson, W., 343, 346, 347, 432, 438
Donn, B. D., 230, 231, 235, 236, 238, 268, 273, 277, 278, 281
Dorman, I. V., 177
Dorman, L. I., 177
Dossin, F. V., 268
Doughty, D. D., 1, 6
Douglas, J. N., 290, 417
Dowden, S., 1, 7
Duchesne, M., 1, 2, 7, 8
Dugan, C. H., 490
Dulk, G. A., 315
Dunham, T., Jr., 6
Dupré, M. F., 1, 10
Dyce, R. B., 288

E

Edlén, B., 57, 461
Efremov, Y. U., 429, 431
Eggen, O. J., 262, 351, 352, 356, 359, 360, 365, 366
Egidi, A., 67
Eichelberger, W. S., 290
Ekers, R. D., 253, 255, 324, 418
Ellerman, F., 149, 150, 151, 153
Ellis, D. V., 399
Ellis, G. R. A., 322
Elsässer, H., 139, 145, 146
Elsmore, B., 419, 423, 439
Elste, G., 156
Elton, R. C., 487, 489
Elvert, G., 166

Elvius, T., 224, 229
Emberson, D. L., 1, 6
Epstein, E. E., 322, 424, 427
Epstein, S. T., 465
Erickson, W. C., 322
Esipov, V. F., 10, 432
Evans, D. S., 33, 34
Eversbed, J., 149

F

Fairfield, D. H., 96
Fan, C. Y., 96, 98
Fanti, R., 252, 255
Fanucci, J., 184
Faulkner, D. J., 58, 73
Faulkner, J., 259, 418
Fay, T. D., 7
Feast, M. W., 51
Felten, J. E., 202, 203, 378, 380
Fenton, A. G., 377
Fermi, E., 166, 186, 197
Fernie, J. D., 47, 48
Field, G. B., 177, 178, 180, 205, 288, 381, 396, 398, 440
Findlay, J. W., 323, 326, 421
Finson, M. L., 280, 281, 282, 283, 285
Finzi, A., 370
Firor, J., 11
Fish, F. F., Jr., 316
Fisher, P. C., 385, 388, 389, 403
Fishman, G. J., 399
Fitch, U. S., 429
Fite, W. L., 208
Follin, J. W., 196
Fomalont, E. B., 429, 439
FORD, W. K., JR., 1-12; 1, 3, 5, 8, 9, 10
Fortini, T., 122
Foster, E. W., 450
Fotheringham, J., 289
Fowler, W. A., 188, 196, 197, 258
Francey, R. J., 377
Fredrick, L. W., 7, 10
Freeman, J. W., 84
Freeman, K. C., 172
Fricke, K., 139, 145, 146
Friedman, H., 373, 376, 377, 386, 388, 390, 392, 398, 399, 408, 410
Froese, C., 456, 462, 464, 475, 489

G

Galt, J. A., 322, 343, 344, 346
Gamow, G., 196
Ganson, A., 4
Gardner, F. F., 167, 250, 252, 253, 255, 324, 420, 433
Garmire, G., 373, 377, 383, 390, 391, 392, 402, 413
GARSTANG, R. H., 449-94; 450, 486, 487, 488, 489, 490, 491, 492
Gasson, R. E. M., 488
Gates, W., 406
Gaustad, J. E., 218, 219
Gaydon, A. G., 487
Gehrels, T., 224, 227, 228
Gent, H., 343, 346
Gerlei, O., 122
Gershberg, R. E., 180
GIACCONI, R., 373-416; 373, 374, 377, 380, 382, 385, 388, 389, 390, 391, 392, 396, 397, 398, 399, 402, 403, 404, 405, 410, 413
Giannone, P., 367
Giclas, H. L., 352
Giere, R. N., 201
Gilbert, H. E., 86, 108
Gilman, R. C., 233
Ginzburg, V. L., 176, 187, 188, 191, 207, 211, 336, 337, 341, 345, 347, 422, 443
Giovanelli, R., 133
Giovannini, C., 252, 255
Glennon, B. M., 449
Gloeckler, G., 96, 98, 204
Gnevyshev, M., 133
Godfredsen, E., 462
Godoli, G., 120
Goh, T., 120, 128
Gold, T., 296, 311
Goldberg, L., 154, 155, 226
GOLDREICH, P., 287-320; 168, 291, 294, 298, 300, 301, 307, 312, 313, 315, 317
Goldstein, R. M., 288
Goldstein, S. J., 205
Goldwire, H. C., 488
Gopasyuk, S., 117
Gordon, K. C., 48, 72
Gorenstein, P., 374, 377, 380, 388, 389, 390, 391, 392, 396, 397, 401, 402, 410, 413
Gosling, J. T., 111
Goss, W. M., 8, 488
Gottlieb, B., 272
Goudsmit, S., 461
GOULD, R. J., 195-214; 201, 202, 203, 204, 207, 208, 209, 233, 373, 376, 377, 378, 379, 380, 409, 413
Gower, J. F. R., 250, 251, 253, 256, 325
Grader, R. J., 377, 378, 380, 399
Graham, J. A., 51
Gray, L. D., 10
Greenberg, J. M., 215, 218, 220, 228, 240
Greenspan, H. P., 313
Greenstadt, E. W., 84, 90 90
Greenstein, G. S., 197
Greenstein, J. L., 230, 240, 258, 351, 352, 353, 354, 355, 356, 359, 360, 362, 365
Greisen, K. L., 202
Griem, H., 362
Gringauz, K. I., 83
Gross, S. H., 288
Grueff, G., 251
Gruzdev, P. F., 489
Gubbay, J. S., 343, 344
Guelke, R., 33, 34
Guerin, P., 289
Guigay, G., 277, 281, 285
Guillaume, C., 236
Guinot, B., 289
Gulkus, S., 315
Gundermann, E. J., 344, 417
Gunn, J. E., 206, 212, 259
GURSKY, H., 373-416; 373, 374, 377, 380, 382, 385, 388, 389, 390, 391, 392, 396, 397, 398, 399, 402, 409, 410, 411, 413
Guss, D., 131

H

Habing, H. J., 204
Hablick, D., 166
Haddock, F. T., 288, 327, 330, 422, 426, 431, 439, 443
Hagesawa, Y., 356
Haggerty, R., 404
Hale, G. E., 149, 150, 151, 153
Hall, J. S., 3, 10, 227, 229, 240
Hallin, R., 42
Ham, F. S., 473
Hamada, T., 357
Hamilton, P. A., 322
Hansen, W., 291, 311
Hardebeck, H. E., 417
Hardie, R. H., 290
Harlan, E., 430, 431, 432
Harman, R. J., 366
Harmon, N. F., 404
Harries, J. R., 377
Harris, B., 424, 426,

427, 429
Harris, D. L., 291
Hartle, R. E., 83
Hartmann, W. K., 316
Hartree, D. R., 456, 461, 468
Hartree, W., 456, 461
Harwit, M., 170
Haurwitz, M., 131
Hayakawa, S., 176, 205, 373, 378
Hayashi, C., 197, 368
Hayes, S., 8
Haymes, R. C., 399, 400
Hedeman, E. R., 122, 132
Heeschen, D. S., 259, 325, 327, 335, 419, 420, 421, 430, 438
Heiles, C., 174, 179, 183
Heise, J., 270, 271, 272, 273
Helliwell, T. M., 483, 485
Hénoux, J. C., 151, 152
Henyey, L. G., 230
Herbig, G. H., 217, 243, 245
Herman, R. C., 196, 197
Herschel, W., 290
Hewish, A., 251, 344, 346, 417, 418
Hey, J. S., 417
Heydenrych, J. C. R., 33, 34
Hide, R., 315
Higgens, G. C., 2
Hill, E. R., 324
Hill, R. W., 377, 378, 380, 399
Hill, S. J., 488
Hiltner, W. A., 3, 9, 41, 47, 49, 56, 72, 227, 377, 413
Hirschfelder, J. O., 465
Hirth, W., 338
Hjellming, R. M., 47
Hobbs, R., 442
Hodge, P. W., 270, 279
Hoffleit, D., 429, 430
Hoffmeister, C., 270
Hogbom, J., 417, 420
Hogg, D. E., 46, 431
Holden, D. J., 251, 255, 325, 335
Hollinger, J. P., 322
Holmes, J., 153, 155
Horak, Z., 462, 465, 466
Hornby, J. M., 188
Horrigan, F. A., 489
Horton, P. W., 418
Hoshi, R., 368
House, L. L., 487, 489
Houtgast, J., 153
Houziaux, L., 267
Hoyle, F., 170, 188, 196, 197, 227, 230, 231, 241, 245, 258, 259, 338, 343, 418, 439, 441, 443
Howard, L. N., 313
Howard, R., 11, 117, 119, 122, 124, 147
Howard, W. E., 288, 322
Howell, T. F., 323
Hubbard, W. B., 229
Hübner, W. F., 267
Hudson, J. P., 230
Hudson, P. D., 347
Hughes, R. G., 251, 255
Hulsbosch, A. N. M., 183
Hults, M. E., 490
Hundhausen, A. J., 86, 87, 108, 111, 271
Hunter, C., 166
Hunter, J., Jr., 432
Husain, D., 490
Hvatum, H., 326, 421
Hyder, C. L., 275

I

Iben, I., 74
Ireland, J. G., 30, 188
Isserschtedt, J., 184

J

Jackson, W. M., 281
Jacobson, A. S., 399, 400
Jacobson, L., 87
Jaegermann, R., 279
Jakimiec, J., 158
Jastrow, R., 315
Jauncey, D. L., 259, 343, 432, 440
Jeffers, S., 4
Jeffreys, H., 314
Jeffreys, W. H., 258, 296
Jennison, R. C., 205
Jensen, E., 158
John, T. L., 355
Johns, R. V., 188
Johnson, H. L., 216, 220, 221, 222, 223, 235
Johnson, H. M., 46, 385, 388, 389
Johnson, H. R., 7
Johnston, P. D., 486
Jokippi, J. R., 204
Jones, D. E., 98, 101, 106, 127
Jordan, W. C., 385, 388, 389
Jose, P. D., 57
Joy, A. H., 149, 150, 151, 153
Judd, B. R., 454
Jugaku, J., 377, 392, 413
Jukes, J. D., 345
Julian, W. H., 168

K

Kahn, F. D., 175, 180
Kamijo, F., 230, 233
Kantor, F. W., 403
Kaplan, S. A., 180, 184, 443
Kardashev, N. S., 166, 168, 338, 339, 420
Kastner, S. O., 387, 389, 469
Kaufman, M., 461
Kaula, W. M., 291, 294, 295, 298, 311
Keeping, E. S., 49
KELLERMANN, K. I., 417-48; 255, 259, 288, 321, 323, 324, 325, 326, 329, 330, 333, 335, 338, 340, 341, 346, 420, 423, 424, 426, 427, 429, 430, 431, 432, 433, 434, 438, 439, 441, 442, 445
Kellogg, E. W., 401
Kellogg, P. J., 84
Kelly, H. P., 457
Kenderdine, S., 254, 256, 259, 322, 330, 338, 348
Kerr, F. J., 165, 168, 187
Khogali, A., 4, 8
Khokhlov, M. Z., 489
Kholodilov, N. N., 326
Khrulev, V. V., 326
Kiepenheuer, K., 131
Kingston, A. E., 378, 380
Kinman, T. D., 9, 155, 367, 430, 431, 432
Kippenhahn, R., 369
Kirkpatrick, P., 403
Kitao, K., 205
Klose, J. Z., 487
Knaap, H. F. P., 233
Knight, R. E., 466
Knopoff, L., 298, 311
Kocharov, G. E., 401
Koehler, J. A., 206, 213
Kohl, K., 369
Kolesov, A. K., 355
Komberg, B. V., 345
Komesaroff, M. M., 290, 417, 418
Koozekanani, S. H., 489
Kopylov, I. M., 9
Kostenko, W. I., 424
Koster, G. F., 489
Kovács, A., 122
Kraft, R. P., 8, 353, 413
Krassovsky, V. I., 7
Krat, V., 118
Kraus, J. D., 325
Krause, F., 190
Kreplin, R. W., 399
Kristian, J., 377, 413
Křivský, L., 133
Kron, G. E., 3, 10, 48, 72

Krueger, T. K., 488
Kruscal, M., 184
Krymkin, V. V., 322
Krzeminski, W., 228, 353
Kuhi, L. V., 8, 47, 53, 54, 55, 57, 72, 74
Kuiper, G. P., 18, 116, 290
Kulsrud, R. M., 184
Kumar, S. S., 369
Künzel, H., 151
Kurfess, F. D., 399
Kurt, V. G., 207

L

Lacey, R. F., 404
Lallemand, A., 1, 2, 7, 8
Lamla, E., 430, 431, 432
Lan, Vo Ky, 488
Landau, L., 105, 107
Langberg, E., 234, 240
Laplace, P. S., 290
Larson, S. M., 316
Lasker, B. M., 187
Laslett, L. J., 298
Lastochkin, V. P., 326, 421
Lavel, G., 277
Lawrence, G., 489
LAYZER, D., 449-94; 454, 456, 461, 462, 465, 466, 467, 473, 475, 484, 485
Lazarus, A. J., 83, 87
L'Ecuyer, J., 367
Lee, T., 223
Lee, W., 311
Legg, M. P. C., 336
Legg, T. H., 343, 344, 346
Leighton, R. B., 105, 115, 116, 117, 159, 162
Lequeux, J., 423
Lerche, I., 171, 340
Le Roux, E., 336, 435, 436
Leslie, P. R. R., 439
Levin, B. J., 279
Levitsky, L., 131
Lewin, W. H. G., 399
Lewis, J. T., 470
Lewis, M. N., 462, 465, 466, 473, 485
Lifshitz, E. M., 105, 107
Liller, W., 268
Lilley, A. E., 321
Limber, D. N., 75
Lin, C. C., 169
Lindblad, B., 168
Lindblad, P. O., 165
Lindsay, J. C., 403, 404, 405
Lingenfelter, R. E., 202
Lipeles, M., 492
Little, L. T., 344, 346
Liu, H., 298
Livingston, W. C., 1, 6, 8, 9
Ljunggren, B., 224
Locke, J. L., 343, 344, 346, 424, 429, 438, 442
Londrillo, P., 263, 338
Long, R. J., 255, 323, 324, 325, 329, 333, 335, 341
Longair, M. S., 251, 255, 258, 259, 262
Loughhead, R. E., 116, 118, 119, 135, 136, 137, 138, 148, 149, 158
Low, F. J., 322, 438, 444
Lowell, P., 289, 290
Lozinskaya, T. A., 166, 168
Lucy, L. B., 369
Lukierskij, A. P., 398
Lüst, R., 275, 279
Lüst, Rh., 275, 276, 278, 279, 281
Luyten, W. J., 258, 260, 351, 352, 365, 366, 428, 445
Lynden-Bell, D., 168, 262
LYNDS, B. T., 215-48
Lynds, C. R., 6, 8, 9, 413
Lyne, A. G., 418
Lyon, E. F., 87, 92
Lyttleton, R. A., 315

M

McCarthy, M. F., 10
McClain, E. F., 188, 420, 440
McCracken, K. G., 105, 108, 377, 399
McCray, R., 345
McCray, R. A., 207, 211, 213
McCrea, W. H., 233
McCullough, T. P., 422
McCusky, S. W., 224
McDonald, F. B., 96, 399
Macdonald, G. H., 256, 259, 330, 338, 340, 348
MacDonald, G. J. F., 289, 292, 293, 294, 296, 311, 316
McDowell, M. R. C., 355
McGee, J. D., 4, 8
McGovern, W. E., 288
Mack, J. E., 381, 396, 398
Mackay, C. D., 418
Mackey, M. B., 250, 252, 253, 255, 324, 433
McKibbin, D. D., 271
McLeish, C. W., 343, 344, 346
MacLeod, J. M., 252
MacMahon, P. A., 33
McMath, R. R., 154, 155
McNally, D., 233
MacRae, D. A., 326
Macris, C., 137
McVittie, G. C., 262
Maer, K., 93
Maffei, P., 273, 292
Makita, M., 136, 139, 140, 146, 147, 148, 155, 161
Malaise, D., 273, 278
Malone, B. S., 487
Maltby, P., 154, 155, 158, 189, 418, 420, 424, 427, 440
Malville, J. M., 488
Mammano, A., 270
Mandel, L., 15, 16, 17, 22
Manley, O. P., 376
Manwell, T., 431
Maran, S. P., 322
Margoni, R., 47
Marik, M., 160
Mark, H., 377
Marochnik, L. S., 275, 276
Martel, T. M., 229
Martres, M. J., 119, 122
Massey, H. S. W., 204
Mathewson, D. S., 170, 184
Mathieson, E., 401
Matson, R. H., 271
Matsuoka, M., 373, 378
Matsushima, S., 355
Matthews, T. A., 356, 418, 419
Mattig, W., 138, 145, 151, 152
Matveenko, L. I., 424
Maxwell, A., 424, 426, 428
Mayer, C. H., 322, 422
Mayer, W., 376, 388
Mazzucconi, F., 120
Medd, W. J., 326
Meinel, A. B., 136
Men, A. V., 322
Mendlowitz, H., 489
Mendoza, E. E., 221, 222
Menon, T. K., 417
Menzel, D. H., 71, 290, 450, 453
Meredith, B. L., 327, 421
Mestel, L., 181, 316, 351, 363, 364
Meyerott, A. J., 385, 388, 389, 403
Mezger, P. G., 321, 326, 327
Michard, R., 119, 138, 148, 155, 158
Michel, F. C., 105
Michelson, A. A., 14, 15, 16
Mickiewicz, S., 401

Mihalas, D., 27, 29, 356, 357, 358
Miley, G. K., 343, 346, 432, 438
Miller, G., 294
Miller, R. H., 3, 36
Mills, B. Y., 324
Milne, D. K., 170, 324, 420
Minkowski, R., 422, 423
Miyamoto, S., 70
Mizushima, M., 490, 491
Moffet, A. T., 418, 420, 424, 426, 427, 429, 431, 434, 439, 440, 441
Mohler, O. C., 154, 155
Monsignori-Fossi, B. C., 120
Mook, D. E., 377, 413
Moore, J. H., 290
Moran, M., 329, 341
Morimoto, M., 136, 139, 140, 148
Morris, D., 167, 290
Morrison, P., 202, 373
Morton, D. C., 357, 358, 369
Mott, N. F., 204
Muhleman, D. O., 288
Müller, E., 226
Münch, G., 48, 49, 57, 67, 72
Muney, W. S., 403, 404, 405
Munk, W. H., 289, 292, 293
Musman, S., 160
Mustel, E., 128
Myers, M. A., 87, 92
Myerscough, V. P., 355

N

Nagasawa, S., 128
Naidenov, V. O., 401
Nakagomi, Y., 128
Nandy, K., 216, 224, 235, 236
Naranan, S., 376, 388
Nariai, K., 354, 355
Narin, F., 279
Narlikar, J., 418
Neckel, T., 224
NESS, N. F., 79-114; 86, 87, 90, 91, 92, 93, 94, 96, 97, 98, 99, 100, 101, 102, 105, 107, 108, 110, 124, 125, 126, 184, 273, 277, 278
Neubauer, F. J., 48
Neugebauer, G., 428
Neugebauer, M., 84, 85, 86, 92, 125
Neupert, W. M., 120, 408
Neville, A. C., 250, 251, 256, 259, 338, 340, 348, 423
Newkirk, G., 81
Newton, A., 290
Newton, R. R., 293
Nicholson, G. D., 420, 440
Nicholson, S. B., 145, 149, 150, 151, 153
Nikitin, A. A., 488
Niklas, W. F., 3, 7
Nikonov, V. B., 9
Nishi, K., 151, 152
Nishida, M., 197
Nishimura, S., 176
Nojima, Y., 128
Notni, P., 279, 284
Novick, R., 492
Novikov, I. D., 370
Noyes, R. W., 105, 115

O

Oda, M., 373, 377, 383, 389, 390, 391, 392, 402, 413
O'Dell, C. R., 229, 366, 367
O'Gallagher, J. J., 101
Oja, T., 224
Oke, J. B., 259, 357, 428, 430, 432
O'Keefe, J. A., 298
Ol', A., 133
Oliver, P. J., 322
Omidvar, K., 387, 389
Onderlička, B., 50
Oort, J. H., 174, 180, 183, 187, 196, 225, 262, 282, 366
Öpik, E. J., 279, 370
Orlov, S. V., 281
Osawa, K., 377, 392, 413
Osmer, P., 377, 392, 413
Osterbrock, D., 272, 280, 281
Ostriker, J., 418
Ouellette, G., 376
Overbeck, J. W., 381, 399
Ozernoy, L. M., 188, 207, 211, 345, 431, 443
Ozerov, V. D., 83

P

Pacholczyk, A. G., 429
Paczyński, B., 75
Page, L. W., 315
Page, T., 315
Pagel, B. E., 488
Pai, L. G., 92
Palmer, H. P., 343, 346
Palmer, P., 321
Paolini, F. R., 373, 374, 382, 395, 396
Papiashvili, I. I., 3, 10
Pariskii, Y., 424
Parker, E. A., 326
Parker, E. N., 82, 111, 171, 282
Parkinson, E. M., 467
Parrish, M., Jr., 409
Parsons, S. J., 417
Partridge, R. B., 196, 197
Pattee, H. H., Jr., 403
Pauling, L., 461
PAULINY-TOTH, I. I. K., 417-48; 255, 259, 323, 325, 326, 330, 335, 338, 420, 423, 424, 426, 427, 429, 430, 431, 432, 434, 438, 439, 441, 442
Pavlovskaya, E. D., 168
Payne, C. H., 57
Peach, J. V., 413
PEALE, S. J., 287-320; 298, 300, 307, 312, 313, 317
Pease, F. G., 15, 17, 18, 20
Peebles, P. J. E., 196, 197
Peek, B. M., 290
Peimbert, M., 229, 367
Pekeris, C. L., 457
Pellat, R., 277
Pelling, R. M., 399, 400
Penfield, H., 321
Penston, M. V., 428, 429, 430, 432
Penzias, A. A., 250, 326, 327
Peterson, B. A., 206, 212, 259
Peterson, L. E., 399, 400
Pettengill, G. H., 288
Pettit, E., 145
Pflug, K., 270
Phillips, J. W., 417
Phillips, T. E. R., 289
Pierce, A. K., 154, 155
Pierce, P. M., 279
PIKEL'NER, S. B., 165-94; 167, 173, 176, 182, 183, 190
Pilkington, J. D. H., 250, 251, 325, 417, 418
Platt, J. R., 237
Pooley, G. G., 254, 255, 256, 259, 261
Popenoe, C. H., 487
Popper, D. M., 8, 354, 357
Porfiriev, V. A., 326
Porter, J. G., 282
Posch, P., 3
Pottasch, S. R., 204
Pounds, K. A., 377
Powell, R. S., 268
Prendergast, K. H., 172
Price, R. M., 324
Price, W. J., 399
Probstein, R. F., 280, 281, 282, 283, 285

Pronik, I. I., 165
Pskovskii, Yu. P., 168
Purgathofer, A., 6
Purton, C. R., 322
Pyper, D. M., 56

R

Racah, G., 454
Radhakrishnan, V., 417, 418
Rädler, K.-H., 190
Rahe, J., 277
Raimond, E., 183
Rakavy, G., 370
Rakos, K. D., 34
Ramana, K. V. V., 326
Ramaty, R., 202
Ramsay, W., 204, 207, 209
Ramsey, H. E., 118, 120
Rao, U. R., 92, 125
Rappaport, S., 376, 388
Rasool, S. I., 288
Rayet, G., 39
Rayrole, J., 151, 152
Read, R. B., 325
Reddish, V. C., 346
Rees, M. J., 207, 209, 345, 443, 445
Reidy, W. P., 403, 404, 405
Remy-Battiau, L., 268
Richards, R. S., 343, 344, 346
Richardson, R. S., 155, 289
Richter, N. B., 269
Rickett, B. J., 418
Ridgeley, A., 487
Riegler, G., 399
Roark, T. P., 229
Roberts, D. L., 279
Roberts, J. A., 290, 420
Roberts, M. S., 42, 45, 46, 47, 166
Robertson, D. S., 343, 344
Robinson, B. J., 206
Rodgers, A. W., 47
Rodrigues, R., 377
Roemer, E., 267
Roger, R. S., 322
Roll, P. G., 197
Rome, J. M., 27, 28, 30
Romishevskii, E. A., 84
Roosen, J., 120
Rösch, J., 10, 136, 137
Rose, L. J., 229
Rose, W. K., 188, 367, 368
Rosen, B., 267
Ross, L. W., 47, 48
Rossi, B. B., 83, 373, 374, 382, 383, 393, 396, 398, 403
Rossiter, R. A., 51
Rotenberg, M., 486
Rowson, B., 343, 346
Rubin, V. C., 9
Rublev, S. V., 71, 76
Ruderman, M. A., 363, 364
Rumsh, M. A., 398
Runcorn, K., 289, 317
Rybchinskii, A. D., 83
RYLE, M., 249-66; 250, 251, 254, 255, 256, 259, 261, 330, 340, 346, 418, 419, 423, 438, 439

S

Sahade, J., 57, 72, 74
St. John, Ch. E., 155
Saito, T., 128
Sakurai, K., 131
Salpeter, E. E., 206, 233, 357, 367, 369
Sandage, A. R., 196, 259, 262, 352, 356, 366, 377, 392, 413, 419, 428, 429, 430, 432, 445
Sanders, F. C., 466
Sanford, P. W., 401
Sargent, W. L. W., 197, 258, 259, 343, 428, 439, 441
Saslaw, W. C., 180, 418
Sato, M., 171
Savedoff, M. P., 175, 176, 369
SAWYER, C., 115-34; 131
Scearce, C. S., 87, 90, 101, 105, 107
Schalen, C., 237
Schatten, K. H., 93, 96, 131
Schatzman, E., 351, 365, 370
Scheepmaker, A., 309
Scheer, D. J., 325
Scheffler, H., 181
Scherb, F., 83, 84
Scherr, C. W., 466
SCHEUER, P. A. G., 321-50; 33, 34, 206, 249, 251, 253, 258, 262, 322
Schiaparelli, G. V., 247
Schild, R. E., 9, 41, 58
Schlüter, A., 157, 186, 187, 275, 277
Schmidt, H. U., 277, 278, 279
Schmidt, M., 249, 258, 261, 282, 366
Schmidt, Th., 227
Schmidt-Kaler, Th., 168, 184
Schorn, R. A., 322
Schröder, G. P., 201, 202, 203
Schröter, E. H., 118, 137, 138, 151, 153, 154, 155, 159, 162
Schusterman, L., 262
Schwarzschild, M., 363
Sciama, D. W., 207, 209, 258, 413, 443
Scott, P. F., 250, 251, 325, 417, 418
Seaquist, E. R., 326
Searle, L., 197
Seaton, M. J., 39, 175, 177, 209, 366, 367, 473
Seek, J. B., 87, 101
Seielstad, G. A., 167
Sekanina, Z., 268
Serkowski, K., 227, 228, 240
Serlemitsos, P., 399
Servajean, R., 154, 155
Sessler, A. M., 298
Setti, G., 259, 263, 338
Severny, A. B., 9, 149, 150, 152
Seward, F. D., 377, 378, 380, 399
Shajn, G. A., 170, 179
Shakeshaft, J. R., 262, 322, 323, 417, 421
Shamey, L. J., 487, 489
Shane, W. W., 165
Shapiro, I. I., 288, 298, 300
Sharov, A. S., 168, 429, 431
Sharp, L. E., 417
Sharpe, J., 399
Sharpless, S., 47
Shaviv, G., 157, 370
Shcheglov, P. V., 10
Sheeley, N. R., Jr., 133, 151, 159
Shimmins, A. J., 253, 255, 324
Shklovskii, I. S., 183, 206, 279, 417, 418, 422, 432, 433, 434
Sholomitskii, G. B., 420, 430, 440
Shore, B. W., 450, 453
Shu, F. H., 169
Shumaker, J. B., Jr., 387
Shuter, W. L. H., 170, 174, 176
Silva, R. W., 87, 92, 271
Simon, G. W., 105, 115, 116, 118
Simon, S., 431
Simpson, J. A., 96, 98, 101, 124
Sinno, K., 128
Sinvhal, S. D., 72
Siscoe, G. L., 106
Sjunyev, R. A., 207
Skilling, J., 340
Slark, N. A., 1
Slater, C. H., 170
Slee, O. B., 321, 324, 343,

346, 419
Sleptsova, N. F., 168
Slipher, V. M., 289, 290
Slish, V. I., 341
Sloanaker, R. M., 188, 420, 422, 440
Smerd, S. F., 342, 417, 443
Smirnov, K. A., 398
Smith, B. A., 289
Smith, E. J., 84, 90, 98, 101, 106, 110, 127
Smith, F. G., 418
Smith, H., 432, 438
Smith, H. J., 10, 47, 51, 57, 290, 429, 430
Smith, J. A., 258, 260
Smith, L. F., 39, 43, 44, 45, 46, 47, 50, 51, 59, 73, 75
Smith, M. A., 255, 325
Smith, M. W., 449
Smith, S. F., 118, 120
120
Smith, W. B., 399
Snyder, C. W., 84, 85, 86, 92, 125
Sodin, L. G., 322
Solomon, P. M., 369
Sonett, C. P., 107, 110
Soru-Iscovici, I., 119
Soter, S., 294, 301, 315
Spada, G., 376, 388, 390, 391, 392, 402
Spinrad, H., 8
Spitzer, L., 175, 176, 180, 181, 188, 232, 233, 234
Sreekantan, B. V., 377, 390, 391, 392, 402, 413
Stankevich, K. S., 326, 421
Stanley, G. J., 321
Statz, H., 489
Staub, H. H., 393
Steavenson, W. H., 291
Stebbins, J., 216
Stecher, T. P., 218, 230, 231, 233, 235, 236, 238
Steele, R., 456
Steenbeck, M., 190
Stein, J. A., 399
Stein, W., 241
Stephenson, C. B., 43, 46
Stepien, K., 188
Steshenko, N. V., 150, 151
Stewardson, E. A., 377
Stewart, A. L., 450, 457, 465, 467, 468
Stewart, M. C., 486
Stewart, P., 255, 325
Stockton, A. N., 9, 413
Stokes, R. A., 196, 197
Stothers, R., 75, 360, 365
Stoudenheimer, R. G., 1, 5
Strand, K. A., 354
Strittmatter, P. A., 418, 432
Strom, K. M., 378
Strom, S. E., 378
Strömgren, B., 44, 174, 225
Strong, I. B., 86, 87, 108, 111, 271
Struve, O., 48, 49
Sturrock, P. A., 83
Suess, H. E., 315
Sugimoto, D., 368, 373
Svatos, J., 229
Swamy, K. S. Krishna, 233, 235, 236, 241
Swanenburg, B. N., 399
Swartz, M., 408
Swenson, G. W., 252
Swift, C. D., 377
Swings, P., 42, 57, 267, 488
Swirles, B., 456, 461
Syrovatskii, S. I., 176, 191, 211, 336, 337, 341, 347
Szilagyi, Z., 404

T

Takakubo, K., 174
Takayanagi, T., 176
Takeuchi, H., 293
Tanaka, Y., 399
Tandberg-Hanssen, E., 135
Tang, C. L., 489
Tannanbaum, H. D., 399
Taylor, R. J., 197
Taylor, J. H., 34
Temesvary, St., 157
ten Bruggencate, P., 141, 143, 147
Terashima, Y., 171
Terashita, Y., 355
Terrell, J., 258, 435, 439, 440
Terzian, Y., 420, 440
Thackeray, A. D., 51, 488
Thaddeus, P., 8
Thomas, N. G., 352
Thomas, R. N., 69
Thompson, D. T., 462, 465, 466, 473, 485
Thorne, K. S., 190
Title, A., 115
Todkill, A., 1, 6
Tolbert, C. R., 183
Tolk, N., 492
Tolman, R. C., 195
Toomre, A., 166, 168
Toor, A., 377, 378, 380, 399
Torelli, M., 122
Tousey, R., 120
Treanor, P. J., 10, 151, 153
Trees, R. E., 454
Trefftz, E., 277, 456
Trimble, V. L., 352, 355, 361
Troitsky, V. S., 323, 326
Truran, J. W., 197
Tseitlin, N. M., 323, 326
Tsitovich, V. N., 167, 347
Tsuji, T., 232
Tucker, W. H., 209, 378, 399, 409
Tunmer, H. E. C., 338, 356
Turkevich, A., 197
Twiss, R. Q., 23, 24, 26, 28, 342, 443

U

Uesugi, A., 355
UNDERHILL, A. B., 39-78; 42, 52, 53, 57, 58, 59, 62, 63, 64, 65, 67, 69, 70, 74, 358
Underwood, J. H., 487, 489
Unno, W., 152
Unsöld, A., 140, 245, 354
Unzicker, A. E., 408
Usher, P. D., 413

V

Vaiana, G., 404
Vajsberg, V. V., 322
Valentine, R. C., 3
Van Allen, J. A., 110
Van Biesbroeck, G., 277
Van Bierkom, J., 486
van de Hulst, H. C., 233, 241
van den Bos, W. H., 354
van den Meijdenberg, C. J. N., 233
van der Laan, H., 185, 423, 434, 435
Vandervoort, P. O., 180
Van Horn, H. M., 363, 364
van Sluiters, A., 153
VAN SPEYBROECK, L. P., 373-416; 396, 401
van't, Veer, F., 139, 146
van Woerden, H., 166, 174
van Wyk, J. D. N., 33, 34
Vanysek, V., 229
Varsavsky, C., 475
Vassell, M., 465
Véron, P., 258, 261
Verschuur, G. L., 174, 178
Vila, S. C., 367, 368
Vitense, E., 160
Volkov, I. V., 10
von Klüber, H., 141, 143,

147, 149, 150, 159
Vorontzov-Velyaminov, B. A., 39, 52
Vseksvintsky, S. K., 284

W

Wachtel, M. M., 1, 6
Wada, M., 373, 383
Wade, C. M., 325, 429, 431
Wagoner, R. V., 196, 197
Walker, G. A. H., 53, 217
Walker, M. F., 2, 7, 8, 10, 280, 290
Wallis, M. K., 274
Waltman, W. B., 326, 421
Wampler, E. J., 243, 244, 432
Wanders, A. J. M., 136
Waters, J. R., 373, 374, 377, 383, 385, 390, 391, 392, 396, 398, 399, 402, 413
Weaver, H., 417
Webber, W., 105
Weber, E. J., 86
Weenen, J., 70
Wehner, G. K., 234
WEIDEMANN, V., 351-72; 353, 354, 355, 356, 357, 358, 359, 360, 362, 364, 365
Weigert, A., 367, 369
Weiss, A. A., 342, 417, 443
Weiss, A. W., 456
Wells, R. G., 289
Wendker, H., 326, 327
Wentzel, D. G., 111, 166, 189
Wesselink, A. J., 51, 432
Westerhout, G., 168, 326
Westerlund, B. E., 44, 46, 75, 104, 231
Westfold, K. C., 336
Westphal, J. A., 377, 413, 432
Weymann, R. J., 207, 211, 212, 263, 429
Whipple, F. L., 267
White, R. H., 369
Whiteoak, J. B., 47, 53, 56
Whitfield, G. R., 323, 324
Whitford, A. E., 33, 216, 220
Whitrow, G. J., 201
WICKRAMASINGHE, N. C., 215-46; 215, 220, 227, 230, 231, 233, 234, 235, 236, 238, 240, 241, 245
Widorn, T., 291
Wiese, W. L., 449
Wiesenfeld, J. R., 490
Wilcock, W. L., 1, 6
Wilcox, J. M., 86, 91, 92, 93, 94, 96, 97, 98, 99, 101, 124, 125, 126, 127, 131, 132, 278
Wild, J. P., 342, 417, 443
Wild, P. A., 170
Wilkinson, D. H., 393
Wilkinson, D. T., 196, 197
Williams, D. A., 233, 234, 238, 241
Williams, D. R. W., 417
WILLIAMS, P. J. S., 321-50; 255, 322, 323, 325, 326, 333, 335, 341, 423
Williamson, J. H., 355
Willis, D., 250, 251, 325
Wilson, O. C., 8, 47, 49, 67
Wilson, R. W., 250, 326, 327, 487
Windram, M. D., 330, 340, 438, 439
Wirtanen, C. A., 430, 431, 432
Witt, A., 230, 239
Wlérick, G., 1, 2, 10
Wolf, C. J. E., 39
Wolf, E., 15, 16, 17, 22
Wolf, R. A., 370
Wolfe, J. H., 87, 92, 271
Wolstencroft, R. D., 229
Wolter, H., 403
Woltjer, L., 166, 185, 188, 258, 259, 345, 441
Womack, E. A., 399
Woolf, N. J., 218, 219, 369
Woolgar, A. J., 1
Wurm, K., 269, 270, 271, 273, 276, 277
Wybourne, B. G., 489

Y

Yakubovskii, O. A., 488
Yalcop, B. D., 201
Yang, K. S., 252
Yen, J. L., 343, 344, 346
Yenicay, G., 399
Young, R., 408

Z

Zacharov, B., 1, 7
Zanstra, H., 70
Zare, R. N., 456
Zastawny, A., 393
Zehnpfennig, T., 403, 404, 405, 409, 410, 411
Zeldovich, Ya. B., 190, 345, 370
Zhelezniakov, V. V., 345, 443
Zhigulev, V. N., 84
Zirin, H., 11, 116
Zuckerman, B., 321
Zulliger, H. R., 399
ZWAAN, C., 135-64; 135, 136, 139, 141, 145, 147, 148, 156, 157, 158, 159, 162
Zwicky, F., 351

SUBJECT INDEX

A

Aberration
  angle, 271
  dynamical, 270
Absolute magnitudes
  and reddening, 225
  white dwarfs, 351
  Wolf-Rayet stars, 49
Absolute monochromatic flux, 27
Absolute monochromatic power
  radio source, 444
Absolute multiplet strength, 463
Absolute orientation
  of rocket, 382
Absorption
  interstellar, 216, 220
Absorption bands, 245
  interstellar, 241
Absorption coefficient
  interstellar medium, 225
  radio source, 436
  see also X ray
Absorption edges, 398
Absorption efficiency
  interstellar, 241
Absorption lines
  solar, 116
  see also Fraunhofer lines
Abundances
  interstellar, 232
  primeval, 197
  solar, 141, 226
  white dwarfs, 354
Acceleration mechanisms, 263, 338, 346, 418
  in comets, 275
Accelerometers
  rocket, 383
Acceptance angle, 386
Accretion
  in binary, 368
  planetary, 315, 316
  stellar, 353
Active regions
  solar, 115-34
Activity complexes
  solar, 122-24
Activity index, 95
  see also Magnetic activity
Adiabatic expansion, 205, 209, 213
  interstellar medium, 183
  of radio source, 337
Adiabatic invariants, 109
Aerial synthesis, 252
Age
  of solar system, 299, 317
  of supernova remnants, 433, 436, 438
Alcohol
  as quenching gas, 394
Alfvén velocity, 158, 170, 184
Alfvén waves, 185, 186, 277
Algonquin Radio Observatory, 424
Alignment error
  collimator, 384
Alignment mechanisms, 240
  interstellar, 240
Alkali halides
  in detectors, 398
Alkali-like atoms
  theoretical atomic transition probability, 459
Allowed transitions, 209
Al_2O_3 foil tubes
  in electronic camera, 3
Al sequence, 474
Aluminization of plates, 4, 5
Aluminum collimators, 385
Ampoules
  for photocathode, 2
Ambipolar diffusion, 182, 186, 187
Analytic solution
  equations of motion, 314
Angle-dependent background, 387
Angular acceleration
  Earth rotation, 289
Angular diameter
  measurement, 13-33
Angular momentum transfer, 168, 293, 296, 302, 315
Angular resolution
  radio, 324
  of spectrograms
    solar, 148
  X-ray detectors, 374, 406
Angular response function, 390
Angular scintillation, 23
Angular size, 259, 330, 343
  radio sources, 343, 395, 440
Angular velocity
  planetary, 298, 307
Anisotropies
  interplanetary medium, 79, 105, 108, 109
  interstellar, 227, 240
  Universe, 190
Annihilation
  magnetic field, 110, 182, 189, 277
  particle, 198
Annual tides, 295
Annular electrodes
  in image intensifiers, 4
Anode misalignment, 395
Anomalous dispersion techniques
  for f values, 486
Anomaly
  true, 299
IIa-O plates, 2
Antenna pattern, 421
Antenna sensitivity
  radio, 323, 420, 421
Anticenter, 175
Anticoincidence counters, 396
Aperture synthesis, 322, 348
Apollo applications, 406
Archimedean Spiral, 82, 83, 89, 90, 102, 111
Arc plasmas, 486
Arend-Roland, 271, 279, 280, 281, 282, 283
Argon
  in counters, 396
Argon atmosphere
  Mercury, 288
Argon sequence, 476, 482
Artifical sources
  radio, 251
Aspect measurement
  in X-ray astronomy, 402-3
Association
  radiative, 233
  stellar, 216
Asteroids, 291
Asymptotic expansions, 468
Asymptotic spin, 299
  in planetary rotations, 298, 305, 307
Atmosphere
  effect on radio observations, 417
  scattering, 135
  solar models, 138-48
  stellar, 352
Atmospheric attenuation
  radio, 323
  see also Ionosphere
Atmospheric extinction, 24

Atmospheric rotation, 289
Atmospheric scintillation, 17, 19, 23, 28
Atomic interactions
integral, 207, 213
Atomic physics data center, 450
Atomic transition probabilities, 449-92
Atomic units, 449
Attenuation
wave, 185
Auger electrons, 393
Aureole
solar, 135
Autocorrelation analysis, 116
interplanetary, 125
solar, 120
Autocorrelation function, 125, 126
Azimuthal quantum number, 452

B

Baades' comet, 280
Back-aluminization, 4
Background rejection, 400-2
Backwarming, 355, 357, 358
Baked emulsions, 3
Balloon observations, 218
X-ray, 373, 376, 377, 382
Balmer discontinuity, 355, 357
Balmer lines
solar, 146
white-dwarf, 353, 357
Wolf-Rayet stars, 39
Bandpass for filters
in photometry, 216
Bands
interstellar, 241
Barium getters, 2
Barometric formula, 171
Barred spirals, 172-74
Baryon conservation
universe, 198
Baselines
for interferometers, 13, 24, 27, 28
Ba spectra, 488
Beaming factor, 444
radio sources, 443
Be filters, 398
Beryllium-copper collimators, 385
Be sequence, 474, 487
Bessel-Bredichin theory, 280, 281, 283
Be stars, 70, 74
Big bang theory, 196, 198
Binary stars, 8, 10, 13
neutron stars, 30, 418
white dwarfs, 353-54, 369
Binding energy
atomic, 459
Bipolar magnetic region, 118
Bivalent atoms
theoretical transition probability, 483
Black-body background, 196, 202, 250, 261, 263
Black dwarfs, 367
Blanketed models
white-dwarf, 355
Blends
spectral line, 141, 146
Blue magnitude, 13
Blue-sensitive cathodes, 2
Bluing, interstellar, 237
Blurring parameter, 136
Bohr radius, 207, 208
Bolometric corrections
in white dwarfs, 358-59, 360
Bolometric surface brightness, 343
white-dwarf, 344, 354
Boltzmann factor, 141
Boundary layer, 83
Bow shock
of Earth, 84, 278
Bragg spectroscopy, 407-9
Bremsstrahlung
intergalactic medium, 199, 209, 212
radio sources, 337
X-ray sources, 397
Brightness fluctuations
radio sources, 417, 432
solar, 118
Brightness temperature, 25, 257, 329, 334, 345
Bright stars, 216
Brillouin's theorem, 455
Broadband photometry, 216
Brueckner-Goldstone formalism, 457
B stars, 41, 169, 216, 220, 229
Burnham's comet, 273

C

C abundances, 226, 232
in comets, 267, 268
interstellar, 176, 177, 226, 227
in white dwarfs, 354, 355
in Wolf-Rayet stars, 39, 41, 51, 57, 58, 67
Calcium emission, 116, 118, 119, 120, 122, 124
Calcium spectra, 488
Calcium spectroheliogram, 116, 117
Calibration, 424
of radio systems, 255, 323-24, 326, 328, 329, 421
California Institute of Technology
radio observations, 419
Cambridge, Observatory, 249, 252, 323, 325, 326, 335, 423
Capture
electron, 209
probability, 301-7, 312-15, 317
Carbon stars, 230
Carina nebula, 47
Cartes Synoptiques, 121
Cascade tubes, 4, 5, 6, 10
Cassegrain-Schmidt cameras, 7
Cassiopeia, 217
reddening, 216, 217
Catastrophic losses
radio sources, 441
Cathodes
for image intensifiers, 2
Cell structure
solar, 116, 117, 118, 119
Centaurus, 168
Center-to-limb variation, 139, 143, 148, 152
Centimeter wavelengths measurements, 323
Central fields, 459
Central forces
atomic spectra, 472
Central meridian passage
of solar cells, 126, 127, 129, 130
Central occultation, 33
Cepheid variables, 36
Cesium oxide detectors, 10
Chandler wobble, 293
Chandrasekhar limit, 365, 369, 370
Characteristic age, 436
of supernova remnants, 434
Characteristic time
for damping, 313
for radio variations, 440
Charge distribution
in atom, 483
Charge exchange
in comets, 277
cross section, 182
Charge separation, 278
Chemical composition
cosmic rays, 191
intergalactic, 207
interplanetary medium, 79
interstellar, 225
stellar, 352
white-dwarf, 357, 359, 363
Chemical fog, 6

Chemical reactions
interstellar, 232, 234
Chromosphere, 107, 154, 158
solar, 115, 118, 119, 122
Cini camera, 10
Circular polarization
of radio sources, 420
of solar radiation, 115, 149
Circular reflection, 24
Circulation patterns, 117
solar, 115
Circum faculaire areas
solar, 118
Circumstellar envelopes, 219, 224, 245
Class Cc spectra, 329, 330
Class Cp spectra, 330
Class Cv spectra, 328
Class S spectra, 328
Cleaning of photocathodes, 2
Close binaries
mass exchange, 369
Closed-shell approximation, 459
Cloud formation
interstellar, 172, 174-88
Clouds
interstellar, 216, 245
Clustering
of radio sources, 251
stellar, 351
sunspot, 122, 123, 130, 131
Cluster main sequence, 75
Cluster parallax, 49, 351
Clusters
formation, 190
galaxies, 195, 206
stellar, 216, 223, 245
Cobalt spectra, 488
Coherence
of solar activity, 131
Coherence theory, 15
Coherent radiation
in radio source, 443
Coincidence counters, 396
Coincidence counting
solar activity, 116
Cold model
solar, 143, 144
Collecting area
radio telescope, 322
Collective interactions
in comets, 281
Collective oscillation, 345
Collectors
light, 23
Collimation, 383-92
mechanical, 375, 381, 384
Collimator acceptance angle, 386, 388
Collimator transmission function, 382
Collisional deexcitation, 394
Collisional ionization, 207, 209
Collision-free waves, 183, 186
Collisionless plasma, 83
Collisionless shocks, 84
Color center, 245
Color difference method, 223
for extinction, 216
Color excess, 220, 223, 225, 244, 245
Wolf-Rayet stars, 49
Color-magnitude diagram, 351, 360-61, 362
Colors
stellar, 354
Coma, 267
Cometary nebulae, 180
Comet tails, 86, 267-86
Commensurability condition, 308
Commutation relations, 471
Compact regions
of solar activity, 125
Compact sources, 335, 341
radio, 330
Companion stars, 31
Comparator, 154
for solar observations, 149
Complex
definition, 461
Complex associations
of radio sources, 251
Complex degree of coherence, 16, 19
Complex spectra, 330, 333, 346
Composite spectra, 45
Compressibility
interstellar medium, 170, 178
Compression waves, 185
Compton collisions, 258, 263, 418, 441, 444
intergalactic medium, 199, 202, 203
Computer analysis
of model atmospheres, 355
of signals for image intensifiers, 2
Concave spectra, 346
radio, 329, 332
Concentric mirror spectrograph, 7
Condensation
cometary, 276, 281
interstellar grains, 231
spiral, 169, 171, 175, 178
Condensation nuclei, 230, 232
Condensation wave, 173
Conducting fluid model
solar fields, 160
Conductivity
interstellar medium, 178
thermal, 184
Configuration
atomic, 451
interaction, 463
mixing, 454
Conjunction
planetary, 309
Constants of integration
planetary rotations, 300
Contact discontinuity, 276
Contact exposure, 7
Contaminants
photocathode, 2
Contamination
counter, 398
Continuity conditions
spiral galaxy, 169
Continuous absorption, 141
coefficients, 355
Continuum, 141, 146
intergalactic, 212
interstellar, 230, 232
radio source, 432
solar, 117
stellar (Wolf-Rayet), 45
Continuum fluid dynamics, 84, 281
Contraction
coma, 268
tensor, 195
time, 74
Contrast
photographic, 135, 136
Convection
solar, 154, 157
Convection zone
solar, 156, 157
Convective cells
Venusian, 311
Convective instability
solar, 160
Convective transport, 92
Convex spectra, 328, 331, 346
Cooling, 211
intergalactic medium, 209
interstellar medium, 176
of white dwarfs, 352, 362-63, 364
Coordinates
for comets, 279
for planetary dynamics, 300
Core, 313
interstellar, 313
planetary, 312
Coriolis force, 171, 190
Corona, 157
comet tails, 267
corotation, 79
galactic, 183, 189

intergalactic medium, 82, 86
Coronal enhancements, 125
Coronal lines, 488
Corona suppression
in images, 4
Corotation, 100-5
coronal, 79
interplanetary medium, 86
Corpuscular radiation
comet tails, 270
Correlation detector, 21
Correlation effects
atomic spectra, 465-66
Correlation energy, 466
Correlation function, 115
Correlation length, 20, 33
Correlators, 21, 26
Cosmic black-body background, 196, 250, 261, 263
Cosmic expansion time, 204, 211
Cosmic-ray diffusion, 191
Cosmic-ray heating, 211
Cosmic-ray interactions, 378
Cosmic-ray pressure, 183
Cosmic-ray production, 200, 203-5
Cosmic rays, 83, 108
intergalactic, 195, 203-5
interplanetary medium, 79, 96, 105, 111
interstellar medium, 170
isotropic, 187
spectral, 170
Cosmological constant, 195
Cosmological hypothesis, 259, 261, 343, 440, 441
for quasars, 418
Cosmological models, 253
intergalactic medium, 195-200
and radio-source counts, 249
Coudé dispersion, 243
Coudé spectrographic cameras, 7
Coulomb approximation, 450
Coulomb collisions, 203
Coulomb integral, 469
Counter efficiency, 394
Coupling, 86, 276, 281, 312, 314, 444
Coupling schemes, 452, 486
Crab Nebula, 183, 321
X-ray observations, 376, 377, 378, 389, 391, 392, 399, 411
3CR catalogue, 249
Crimean Observatory, 10, 150
Critical density, 179
Critical libration, 313
Critical mirror separation, 17
Critical point, 281, 303
Critical radius, 231
interstellar grain, 231
Cross-correlation coefficient, 91
Cross-correlation function, 116, 125, 126, 128
Cross section
ionization, 204, 207
Crust
planetary, 311
Crystal detectors, 399
Crystal lattice, 245
interstellar grains, 234
Crystallization
in white dwarfs, 363
C sequence, 474
CsI photocathode, 398
Cs-Sb cathode, 2, 3
4C survey, 250-52, 254, 256, 263
5C survey, 256, 263
Curvature parameter, 195-96
Curve of growth
for spectral line, 142
Cutoff energy
X-ray spectrum, 379
Cygnus Loop, 183, 187
Cygnus nebula, 47
Cygnus reddening, 216, 217, 221, 235, 236

D

D abundance, 197
Damping, 307, 311, 312
oscillation, 293
profile, 243
Daniel's comet, 270
DA stars, 352, 353, 355, 359, 360, 361
Data-transmission rocket, 383
DB stars, 353
DC stars, 353, 359
de Broglie wavelength, 200, 337
Debye cooling, 365, 366
Debye temperature, 363, 364
Decameter emission, 315
Jovian, 290
Decay
of solar structure, 151
Decay time
of solar structure, 162
Deceleration parameter, 196, 205
Decametric emission, 323, 325
from Jupiter, 290, 417
Decoupling of comet tails, 279
Definition, photographic, 135
Deformation, 314
nonhydrostatic, 311
Degenerate stars, 352, 358
Degree of coherence, 16, 24
Degree of ionization, 207
Degree of polarization, 432, 436
radio, 426
Demodulated spectrum
cosmic-ray, 204
Density-exposure plots, 3
Density fluctuation
photographic, 115
Density inversion
solar, 157
Density scale height
solar, 160
Density waves
spiral structure, 169, 172, 174
de Sitter universe, 257
Destabilization
planetary orbits, 31
Destruction ratio
nucleon, 204
Detached shock, 84, 278
Detection limit
radio sources, 251
Detectors
photosensitive, 2
X-ray, 392-400
DF stars, 353
DG stars, 353, 359
Diamagnetic grams, 240
Diatomic molecules
interstellar, 232
Dielectric grains
interstellar, 233
Dielectronic recombination, 207, 208, 209
Differential cosmic-ray flux, 204
Differential expansion, 202
Differential redshift, 200
Differential rotation, 169, 172, 188
galactic, 168
solar, 98
Differential X-ray spectrum, 378
Diffraction, 32
X-ray, 17, 404
Diffraction curve, 408
Diffraction pattern, 33
Diffuse background
X-ray, 378, 381
Diffuse features
interstellar, 243-45
Diffusion
ambipolar, 182
electron, in radio sources, 340

Digitization
of electronic output, 2
Dilution effects, 69
Dipole acceleration, 451
Dipole length, 469-70
Dipole radiation
interstellar, 239
Dipole velocity, 451, 469
Direct comets, 271, 272
Directivity
forward, 239
Direct rotation, 288
Discontinuity
contact, 278
tangential, 105, 106
Discrete levels
atomic, 209
Discrete sources
radio, 417-95
variable, 249-64
Disk
galactic, 165
solar, 118, 119, 124, 129, 135, 141, 151
Disk population, 39
Dispersion
of errors, 271
of spectrogram, 140
velocity, interstellar, 70
Dispersion measurements, 450
Dispersion medium
and radio sources, 443
Dispersive techniques, 398
Dissipation, 312, 313, 315, 317
interstellar medium, 180, 185
tidal, 292, 294
Dissociation
in comets, 267
interstellar, 232
Dissociation continua
in interstellar space, 232
Distance modulus, 50, 220
Distorted systems of stars, 17
Distortion
tidal, 291
Distribution function
for interplanetary fields, 101, 102
interstellar grains, 238
Disturbing function, 296, 297
Diurnal tides, 295
DK stars, 353, 359
DM stars, 353
Dominion Astrophysical Observatory, 67
Dominion Radio Observatory, 326
Doppler plate
solar, 116, 117
Doppler profile, 174
Doppler shift, 153
radio source, 342
in solar spectra, 115, 116
Doppler spread
radar signals, 288
Double-lined binaries, 57, 73
Double sources, 259, 330, 346, 347
radio, 251
Doubly excited configurations, 455
Drag forces
in comets, 279
D-Sheet tangential discontinuity, 110
DO stars, 353
D-type front, 180
Dulong-Petit's law, 363
Dust
emission from comets, 281, 282
interplanetary, 267
interstellar, 215-16
Dwarf novae, 353
Dwarf stars, 36
Dynamical aberration, 270, 285
Dynamical variables, 451
Dynamic equilibrium, 167, 178
Dynamics
planetary, 287-318
Dynamo process, 190
Dynodes
for secondary emission, 1, 6

E

Early-type stars, 215, 218, 221, 293
Earth
atmosphere, 82, 135
bow shock, 278
core, 314
magnetic field, 79, 80, 87, 92
radio observations, 417
rotation, 287, 289, 307, 310
tides, 293, 294, 297
Earth-orbiting satellites, 87
Eccentricity
orbital, 293, 297, 300, 301
Eclipse observations
and planetary rotation, 289
Eclipsing binaries, 47, 68
Edge discontinuity, 381
Edinburgh Symposium, 245
Effective charge, 460
Effective charge ratio
theoretical atomic spectral, 479
Effective potential, 473
Effective quantum number, 480
Effective temperature, 159
solar, 145
stellar, 28
white dwarfs, 355, 356, 359, 360
Wolf-Rayet stars, 68
Efficiency factor, 235
Efficiency of quantum detectors, 2, 3
Eigenvectors, approximate
atomic, 458
Einstein-deSitter cosmology, 257
radio sources, 201
Einstein field equations, 195
Elasticity
planets, 293
Electrical conductivity
solar, 162
Electrical focus
of radio telescopes, 421
Electric dipole transition, 450
Electric fields
in comets, 281
Electric quadrupole transition, 485
Electrographic systems, 1, 2, 4
Electron configuration, 452
Electron density
solar, 121
Electronic amplification
of images, 1-11
Electronic camera, 1, 2
Electron-ion pairs
in counters, 393
Electronographic systems, 1, 2-5
Electron optics, 2, 4
Electron pressure, 141, 142, 146
in white dwarfs, 354
Electron scattering
in stellar envelope, 49
Electron-sensitive emulsion, 1, 4, 5
Electron temperature
intergalactic, 207, 209
Electrostatic focusing, 2, 3, 10
Emission arcs, 450
Emission lines
in radio sources, 432
solar, 117, 120
in Wolf-Rayet stars, 39
Emission nebulae, 180, 187, 229
Emissivity
in radio sources, 436

Empirical corrections, 17
Empirical model, 157
  solar atmosphere, 143, 145
Emulsions
  electron-sensitive, 1
Encapsulated photocathodes, 2, 4
End field distortion, 395
Energy conservation, 393
Energy level calculations, 451
Energy-momentum tensor, 195
Energy parameter
  atomic spectra, 460
Energy resolution, 395
Energy selection
  in counters, 396
Energy-sensitive detectors, 400
Energy spectrum
  positive ions, 83
Energy transport
  solar, 159, 161
Enhanced emission, 117
  of particles, 128, 130, 141, 142
Entrance window, 394
  in counter, 393
Envelope structure
  comets, 278
  of stars, 29, 367
  Wolf-Rayet stars, 49
Epoch maps, 92
Equations of motion, 308, 309, 312
  orbital - atomic spectra, 451
  planets, 299
Equatorial bands
  planetary, 289
Equilibrium conditions
  interstellar, 181-82
Equipartition, 211
Equivalent pendulum, 303, 311
Equivalent width, 140, 141, 142, 146, 148
  interstellar features, 243
Escape peak, 396
Euclidean universe, 250, 252, 253, 257
Europa, 291
Evershed flow, 161, 162
Evolution
  comets, 275
  galaxy, 418
  and intergalactic matter, 195, 199, 211
  interplanetary structure, 103
  radio sources, 436
  spiral structure, 173
  tidal, planetary, 317
  Universe, 249, 250, 261, 262, 264
Exchange effects, 485
Exchange reactions, 234
Excitation
  interstellar, 176
Excitation potential
  of state, 147, 150
Expansion
  Hyades, 32
  interstellar medium, 180
  radio source, 340
  solar active region, 121
  supernova remnants, 337
Expansion scale factor
  of Universe, 195-96, 198, 199
Expansion time
  cosmic, 204, 209
Expectation value
  binding energy, 460
Experimental transition probability, 450
Exploding galaxies, 211
Explorer 10, 83, 84
Explorer 12, 84, 96
Explorer 18, 87
Explorer 33, 110
Explosive phase
  solar active region, 121
Exponential spectra, 338
Exponential time constant, 314
Exposure time, 2
Extended atmospheres
  Wolf-Rayet stars, 65
Extended Hartree-Fock approximation, 462
Extended sources, 252, 337
  radio, 421
Extinction, 24
Extinction curve, 235, 236
  interstellar, 215, 216, 220, 221, 223, 225
Extinction law, 237
Extinction ratio, 219
Extragalactic radio sources, 249-62, 322, 417, 419, 422
Extragalactic X rays, 381
Extraterrestrial civilization
  possible signals from, 417
Extreme-ultraviolet spectra, 121
  solar, 120

F

Fabry lens, 403
Faculae, 133, 160
  solar, 116, 118, 119
Fan
  magnetic field, 156
  solar, 151, 152
Fan-beam observations, 252, 255
Faraday rotation, 167, 169, 177, 181, 188
Fe spectra, 488
Fermi acceleration, 187, 347
Fermi levels, 237
Fibrils
  solar, 117
Field equations, 195
Field embedding, 276
Field lines
  on Sun, 151
Field reversal
  solar, 125, 128
Field stars
  reddening, 244
Filamentary structure, 156, 162
  comets, 268, 273, 274
  interplanetary field, 128, 129
  interplanetary medium, 79, 86, 105, 106, 108, 112
  interstellar, 182, 183, 185, 188
  radio source, 422
  sunspots, 137, 138, 156
Film handling devices, 4
Filters, 221
  for photometry, 216
Fine-grained emulsions, 3
Fine structure, 146-47, 149, 151, 154, 161
  comets, 268, 270, 273, 281, 283, 285
  interstellar field, 188
  solar, 136-38
Fine-structure constant, 207
First adiabatic invariant, 109
Five-dynode tube, 6
Fixed-core approximation, 458-61
Flares, 121, 133
  solar, 116, 119, 122
Flare stars, 179
Flash phase
  solar active region, 121
Flat spectrum, 325, 329, 335
  radio, 440
Flow parameters
  in comets, 281
Fluctuations
  interplanetary field, 105
  interstellar medium, 165, 171, 180, 228
  orbital parameters, 307, 312
Fluctuation scale
  interstellar, 189
Fluid core model, 317
Fluorine in counters, 398

Flux conservation condition, 337
Flux deficit
solar, 160
Flux tubes, 158
interplanetary, 106, 107
solar, 152
f number, 404
Focal plane, 6
curvature, 3
Focus
of radio telescopes, 421
Focusing
density, 183
electric, 2
Focusing devices
X-ray, 404
Fog level
in emulsion, 3
Forbidden transitions, 209, 233, 487, 488-92
Force-free fields, 275, 277
Forcing potential, 296
Foreshortening, 139, 152
correction for, 119
Formation of galaxies, 418
Fort Davis Observatory, 424
Forward directivity, 239
Fossil tracers, 289
Four-grid collimator, 390, 391
Fourier analysis, 309
Fourier transform, 16, 19
Four-sector structure, 96, 98
Fourth Cambridge Catalogue, 250-52
Fragmentation
solar active region, 121
Fraunhofer lines, 140-41, 143, 146, 149, 150, 152, 153, 156, 161
Free-free absorption, 341
intergalactic, 201
Free-free emission, 321
Free oscillation, Earth, 293
Frequency-dependent tides, 305, 307
Frequency structure
radio sources, 418
Fresnel distance, 323
Friction, tidal, 291-98
Friedmann models, 250
Fringe pattern, 20
Fringe visibility, 15, 18, 19, 20, 22
Frozen-in fields, 270
intergalactic, 276, 278
interstellar, 82, 182
f sequence, 474
Full-wave half-maximum (FWHM), 391
f value, 450
for forbidden transition, 233

G

Galactic center, 165
X-ray observation, 392
Galactic corona, 183, 189
Galactic magnetic field, 227
Galactic nuclei, 330
as radio source, 444
Galactic plane, 245
extinction, 216
interstellar medium, 165, 187
Galactic pole, 174
Galaxies, 202
brightness fluctuations, 418, 419
evolution, 418
formation, 200, 211, 262, 428
interactions of neighboring, 191, 195, 196
radio, 321, 335
X-ray observations, 376
Galaxy, The
interstellar medium, 165-91
Galaxy clusters, 196, 206
Galilean satellites, 295
Gamma-ray conversion, 400
Gamma rays
intergalactic, 203
in quasars, 343
Gas dynamics
of spiral structure, 169
Gaseous nebulae
helium abundances, 197
radio observations, 321
Gas gain, 393
Ge spectra, 488
Gas proportional counter
in X-ray astronomy, 381, 393, 395
Gaussian components, 174
Gaussian (error) function, 136, 139
spectral index, 243, 333
Gaussian units, 157
Gaussian variables, 22
Geiger counters, 396-97
General relativity, 195
Geomagnetic activity
solar, 92, 95, 124, 125, 126, 128, 129, 130
Geomagnetic field, 80
Geomagnetic index, 97, 128
Geomagnetic tail, 273
Geometric lag, 298
Getters
in electronic cameras, 2
Giant stars, 18, 233
Globular clusters, 10
Göttingen observations
solar, 143, 145, 146, 147
Gradient
magnetic solar, 117
Grains
interstellar, 215, 220, 230-31
photographic, 2
Granules, 162
solar, 116
Graphite particles, 227, 236, 237-38, 240, 246
in interstellar space, 215, 228
Gravitational asymmetry, 315
planetary orbits, 311
Gravitational break-up
of comets, 267
Gravitational collapse
and supernova, 442
Gravitational condensation, 182
Gravitational contraction, 363, 368, 369
Gravitational drift, 182
Gravitational forces, 195
Gravitational instability, 174
Gravitational redshifts, 342, 343
Gravity, 161
solar, 148
Gravity-radius relation, 360
Gray atmospheres, 357
Great Red Spot, 289, 290, 315
Green Bank, 323
Greenwich Observatory, 131, 132
comets, 275, 277
Ground-based observations
and image intensifiers, 2
solar, 137
Guard counters, 400
Guiding of instruments, 19
Gum nebula, 47
Güttler theory, 241
Gyrofrequency
electron, 336
Gyroscopes on rockets, 383

H

H
in gaseous nebulae, 321
intergalactic, 207
interplanetary medium, 79
interstellar, 190, 233
metastable, 245
photometry, 225
regions, 232, 233, 234
solar, 116, 117, 118, 119, 121, 141, 145, 153, 154, 405

in white dwarfs, 353, 354, 358, 360
Halley's comet, 267, 273, 274
Halo
of comet, 267
galactic, 177
Halogens, 490
Halo stars, 197
Hamiltonian formalism, 451
Hard X-ray detection, 399
Harmonic mean temperature, 175
Harmonic motion of electrons interstellar, 239
Haro-Chavira, 271, 280, 282
Haro-Luyten objects, 9
Hartree-Fock wavefunctions, 454, 465, 466, 467
Harvard Observatory plates, 430
Hayashi collapse, 74
H-C-N-O system, 230
He
abundance, 197
in gaseous nebulae, 321
intergalactic, 207, 208, 212
solar, 120
in white dwarfs, 353, 355
in Wolf-Rayet stars, 39, 67, 355
Head of comet, 273, 274, 275, 277
Heating
intergalactic gas, 204
Heat transport
planetary atmospheres, 288
Heliocentric longitude, 130, 131, 132, 308
Helium burning, 364, 367
Helium star, 75
Helliwell's method, 483
Hellman-Feynman theorem, 464
Hertzsprung-Russell diagram, 75, 360-61, 362, 364
Hertzsprung-Russell gap, 361
He I sequence, 487
High-resolution photographs
of solar structure, 137
High-resolution radio observations, 252, 254, 423, 445
Histograms, 131
of geomagnetic activity, 128, 129
H_2O
in comets, 267
interstellar, 227
Homogeneous cosmological models, 198
Homogenous models
solar, 146, 148
Homologous contraction, 370
Honeycomb collimators, 385
Horizontal-branch stars, 197
Hot model
solar, 143
Hubble constant, 196, 201
Hubble diagram, 196
Hubble radius, 200, 204, 209
Hubble time, 205
Humason's comet, 268
Hyades, 369
white dwarfs, 351, 362
Hydrodynamical model, 276
comets, 277, 278
Hydrodynamic turbulence, 186
Hydrogen burning, 197
Hydrogen depletion
in white dwarfs, 354
Hydrogenic approximation, 354
Hydrogenic normalization, 473
Hydrogenic wavefunctions, 459
Hydromagnetic compression, 185
Hydromagnetic waves
solar atmosphere, 160
Hydroscopic materials for detectors, 399
Hydrostatic equilibrium, 138, 139, 140, 146, 148, 156
Hydrostatic pressure, 143, 144
Hylleraas calculations, 457
Hyperfine levels in atomic spectra, 490
Hypersonic flow, 274

I

Iapetus, 291
IAU classification system, 40
"Icy conglomerate model," 267
Icy particle model
for interstellar grains, 215, 231-32, 237-38, 246
Ideal collimator, 386
Ideal detector, 2
Ikeya-Seki, 284, 285
Ilford G5 emulsion, 3
Ilford L4 emulsion, 4
Image converter, 1, 6
Image intensification
electronic, 1-11
Image orthicon, 1
Image tubes, 1, 2-9
Imbedded fields, 82, 276
Imp 1, 87, 88, 89, 90, 91, 92, 96, 98, 99, 102, 103, 124, 125, 126, 128
Imp 2, 96, 97, 103, 127, 128
Imp 3, 93, 96, 98, 99, 100, 102, 105, 108
Impurity-induced absorption
interstellar particles, 241, 242
Inclination
comets, 271, 294
orbital, 289
Inclination polynomial, 295
Independent orbital approximation, 470-71
Index of refraction
of dispersive medium, 443
Inelastic collisions
intergalactic medium, 212
Inertial attitude of rocket, 383
Information storage capacity
electronic camera, 3
Infrared cathode, 2, 5, 10
Infrared colors, 219, 223
Infrared excess, 223
Wolf-Rayet stars, 73
Infrared image converters, 1
Infrared observations
radio source, 429
solar, 145
Infrared spectrometers, 218
Inhomogeneities, 156
atmospheric, 135, 136
Injection mechanisms, 340
Instrumental errors
radio observations, 28, 33, 250
solar observations, 135, 141
Integrated emission
intergalactic, 200
radio, 251, 257
Integration time, 136
Intensification, 141, 142, 143, 144, 146
Intensity function, 16
Intensity interferometer, 15, 21-22
Interchange instability, 171, 182
Interchange theorem, 465, 466, 467
Interference filters, 229
Interference fringes, 14
Interferometer observations, 251, 252, 258, 345, 346
radio, 419, 423, 433, 440, 445
Intergalactic matter, 195-213
Intergranular lanes
solar, 118
Intermediate coupling, 312, 453, 486-92

Interplanetary drag hypothesis, 201
Interplanetary magnetic field, 79, 92-111, 124-33
Interplanetary medium
effect on radio observations, 417-49
properties, 79-114
Interplanetary plasma, 125, 126
and comet tails, 267
Interplanetary sector structure, 92-111, 125, 126, 127
Interstellar bluing, 237
Interstellar lines, 244
Interstellar medium, 346
dust, 215-46
optical observations, 9
and radio observations, 346, 417, 418
structure and dynamics, 168-91
X-ray observations, 373, 378, 381, 384
Interstellar reddening law, 216, 219, 228, 381
Wolf-Rayet stars, 53, 56
Invariance
rotation, 457
Inverse Compton effects, 338, 343, 344, 345, 416, 440, 443
Inverse β decay, 370
Inversion of polarity
solar, 119
Io, 291
Ionic comet tails, 271
Ionization
in comets, 277
lifetimes, solar, 121
Ionization equation, 207
Ionization equilibrium, 176
Ionization front, 180
Ionization loss, 187, 337
Ionization mechanism
in comets, 278
Ionization potential
of element, 142
Ionospheric scintillation, 321
of radio sources, 417, 420
"Iron filing" structure, solar, 118
Irreducible tensor, 452
Isentropic models, 370
Isentropic processes, 178
Isobaric processes, 178
Isochoric processes, 178
Isoelectronic sequence, 461
Isophoto maps, solar, 137
Isothermal core
white dwarfs, 368
Isothermal shocks, 180
Isotropic cosmological models, 198
Isotropic model
of radio source, 444
Iterative solutions
Hartree-Fock equations, 486

J

Jet Propulsion Laboratory
radar, 288
Jet structure
galaxies, 414
JJ coupling, 486
Jodrell Bank, 26
Johann-Mount crystal, 409
Jupiter
radio emission, 10, 417, 419
rotation, 287, 289-90, 315

K

K edge, 384, 396, 398
Keplerian orbits, 294
ket vectors, 452
K filter
photometry, 223
Kinematic viscosity, 313
Kinetic pressure, 184
Kinetic temperature
of radio source medium, 443
Kitt Peak, 9
Kodak films, 402
Kron tube, 4
Krypton in counters, 396

L

Lag angle, 292, 298
Lagrange multipliers, 456
Lallemand electronic camera, 1, 2, 3, 10
Lambertian distribution, 5
Landé g factors, 486
Langmuir waves, 186
Laplace coefficients, 309
Large Magellanic Cloud, 166, 184
Larmor radius, 273, 277, 278
Late-type stars, 221
diameter, 18
reddening, 222
Latex rubber collimators, 385
Lattice defect, 245
L edges, 396
Lenard-window tube, 4, 56
Lens systems for solar observations, 135
Lepton conservation
Universe, 198
L filter
photometry, 221, 223
Libration, stable, 300, 302, 305, 307, 311, 312, 313
Lick Observatory, 243
Liège International Astrophysical Symposia, 269
Lifetime
comet structure, 377
solar active region, 121, 122, 124
solar structure, 131, 136, 137, 138, 150, 151, 156
Light bridges
solar, 118, 138, 150
Light collectors, 23
Light curve
for binary stars, 48
variable radio source, 432, 436
Light peninsulas, 138
Light pressure
interplanetary medium, 81
Light tongues
of solar structure, 138
Light yield
detector, 399
Limb, 119, 135, 139, 140, 153, 155
solar, 116
Limb brightening
solar, 120
Limb darkening, 27, 28
solar, 120
Limiting coupling schemes, 486
Limiting flux density, 254, 324, 325, 333
radio observations, 250
Linear polarization, 342
in radio sources, 418
Linear solution for spiral structure, 169
Line blanketing, 28, 358
Line formation
solar, 142
Line-free atmospheres, 357
Lines of force, 156, 161
interstellar medium, 166, 181
on Sun, 152, 153
Liquid air
refrigeration of electronic camera, 2
Liquid-core model
planet, 307, 312
Li sequence, 474
Livermore Radiation Laboratory, 380
Local hypothesis, 260, 343, 346, 441
for quasars, 418
"Local" models, 252, 258, 259

Local spiral arm, 168, 225
Local structure
interstellar medium, 165, 168
Local thermodynamic equilibrium, 141
Logarithmic spiral arms, 168
log N - log S relation, 253, 256
Long-baseline interferometry, 347
Long-focus telescope, 10
Longitude clustering, 132
Longitudinal fields, 117, 149, 151, 159
Lorentz factor, 205
Los Alamos Laboratories, 86
Love number, 292, 294
Lowell Observatory, 9
proper-motion survey, 352, 365
Low-frequency cutoff, 330, 341-42, 346
radio, 325
Low-noise amplifier, 325
LS coupling, 487
Luminosity class, 216, 223
Luminosity function
white dwarf, 364-66
Luna I, 83
Lunar occultations of stars, 13
X-ray source, 391
Lunar rotation, 291
Lyman α, 176, 206, 212, 213
Lyman limit, 187
Lyman lines, 358

M

M13, 10
M15, 10
M31, 8
M82, 173
M87, 376, 388, 413
Macroturbulence
solar, 156
Magellanic Clouds, 44, 45, 49, 50, 165, 413
Magnetic activity index, 92, 99
Magnetic dipole transition, 488
Magnetic field annihilation, 110
Magnetic fields, 117, 123, 124, 126, 138, 148-53, 155
in comets, 274
galactic, 227
interplanetary, 79, 270, 273, 276
interstellar, 167, 188-91
Jovean, 290
photosphere, 125
in radio sources, 422, 434, 445
solar, 115
Magnetic focusing
image intensifier, 4
Magnetic intensification, 156
Magnetic multipole radiation, 490
Magnetic pressure
interstellar, 170, 172
solar, 156, 161
Magnetic quadrupole radiation, 491
Magnetic sector structure, 92-111, 278
Magnetic storms, 80, 89
Magnetic stress, 313
Magnetic tubes, 167
Magnetic viscosity, 182
Magnetoacoustic waves
interstellar, 185
solar, 160
Magneto-aerodynamics
of spiral structure, 169
Magnetobremsstrahlung, 321
Magnetograms
solar, 83, 89, 148, 149
Magnetohydrodynamic discontinuity, 106, 111
Magnetohydrodynamic equilibrium, 170
Magnetohydrodynamics
of comet tails, 267, 285
of interplanetary plasma, 82, 105
of sunspots, 160
Magnetometers
in rockets, 382
Magnetosheath, 83, 89, 92
Magnification
image, 6
Main-sequence stars, 13, 14, 28, 351, 354, 356, 366
Major planets, 294
Mantle
interstellar grains, 234
planetary, 311, 313
Many-configuration approximation, 454-69
Mariner 2, 84, 85, 86, 90, 92, 96, 110, 124
Mariner 4, 99, 101, 106
Mars
rotation, 289, 316
Maser action, 345
Masers
radio, 322
Mass
stellar, 353-54, 361-62
Wolf-Rayet, 48
Massachusetts Institute of Technology, 382, 424
Mass deficit, 366
Mass exchange
close binary, 369
Wolf-Rayet, 76
Mass loss
from comets, 267
stellar, 366, 369
Wolf-Rayet, 96
Mass-luminosity relation, 76
Mass-radius relation, 360, 362
Matrix methods
atomic spectra, 457
Maxwellian distribution
velocity, 206
Mean extinction, 217, 235
Mean free path
absorption, 202
in comets, 281
intergalactic, 209
interplanetary medium, 83
Measuring microscope, 154
Mechanical collimators, 375
Mechanical equilibrium
solar structure, 156, 157, 159, 161
Mechanical stability of instruments, 20
Melinex backings
for plates, 4
Melting
in white dwarfs, 363
Mercury, 316
rotation, 287-88, 291, 294, 295, 298-307
Meson production, 203
Mestel-Ruderman theory, 364
Metagalactic field, 189, 190
Metagalactic gas, 183
Metallized mylar
in detector windows, 394
Metals
interstellar, 226, 229
solar spectrum, 142
in white dwarfs, 354, 459
Metastability
of atomic levels, 487
Metastable levels
hydrogen, 245
Meteors
and comet tails, 267
Methane in detectors, 394
Metric, 343
general, 195
Meudon, 121
Mg
interstellar, 183
sequence, 474
solar, 147, 226
in variable radio source, 432

in white dwarfs, 351, 360
X-ray lines, 378
Mica
in image intensifiers, 4
-window detectors, 398
Michelson interferometer, 13, 15, 20, 36
Microdensitometer tracings
X-ray photography, 411
Microphotometer tracing
solar line spectrum, 150
Microturbulence
solar, 156
Microwave radiation
solar, 128
Universe background, 202
Mie theory, 240, 241
Milky way
and interstellar dust, 216
Mira variables, 231
Mirror separation
in interferometer, 14
Mirror surfaces
for solar observations, 135
Mixed comets, 279, 281
Mixing coefficient, 455, 462
Mixing-length approximation, 160
Mn spectra, 488
Model parameter, 140, 148
Modes
tidal, 299
Modulation
cosmic-ray, 204
by solar wind, 105
Modulation collimator, 390, 391, 392
Moire effect, 116
Molecular aggregates, 232
in interstellar space, 215
Molecular drag coefficient, 281
Molecular formation, 233
Molecular fragments, 219
Molecular spectra, 147-48, 156, 242
in comets, 267, 278
solar, 141
stars, 219
Molecular weight, mean
in comets, 278
Moment of inertia, 299, 312, 316
Momentum transfer
in comets, 81, 281
Monochromatic fluorescence, 69
Monochromatic observations
solar, 139
Monochromatic photometry, 216
Monochromatic power, 249
Monopolar structures
solar, 150
Monte Carlo techniques, 313
radio observations, 251
Moon
limb, 37, 391
occultations, 32-33, 294, 295, 297, 301, 307, 311, 317
probe, 83
rotation, 287, 289
Morehouse's comet, 275, 276, 277, 278
Mosaics
paraboloidal, 26
Mount Wilson observations, 11, 36, 125, 147, 150, 153
comets, 274, 282
solar, 143
Movable mirrors, 17
Moving atmospheres, 71
Moving-plate technique, 9
M region, 81, 95, 124, 127, 128, 130
Mrkos, 268, 273, 279
M stars, 219, 221, 223, 231, 233
Multialkali cathodes, 10, 21
Multi-arm galaxy, 168
Multiple stars, 17
Multiplet structure, 487
Multipolarity, 491
Mutual coherence, 15
Mylar backing
for plates, 4
Mylar windows
for counters, 398

N

N
abundance, 226, 232
in comets, 81, 268
interstellar, 177, 226
sequence, 474
in Wolf-Rayet stars, 39, 41, 51, 57, 58
Na
in detectors, 399
interstellar, 177
sequence, 473, 480, 481
in white dwarfs, 355
NaD_2 line, 67
Na_2-K-Sb_3-Cs cathode, 2
Narrabri interferometer, 24, 28, 31
Narrow-band
line emission, radio, 417
Narrow-band photometry, 70, 216, 225
classification by, 44
Narrow collimators, 388
NASA ATM telescope, 407
National Bureau of Standards, 449
National Radio Astronomy Observatory, 140, 150, 190, 325, 326, 335, 424, 425, 426, 442
National Radio Laboratory, 382
Natural periods
solar system, 291
Ne
in H II regions, 202
sequence, 487
Nebulae
gaseous helium abundance, 197
radio observations, 229, 321
Nebular lines, 487
Neon
X-ray emission, 377, 378
Neptune
rotation, 290, 316
Neutral atoms
theoretical calculations, 485
Neutral line
solar, 120, 151
Neutral sheet
acceleration, 108, 277
Neutrino cooling, 365
Neutron stars
oscillation, 370
as radio source, 418
Newtonian cosmology, 196, 198
N filter
photometry, 223, 229
NH
in comets, 267
NH_2
in comets, 267
NH_3
in comets, 267
interstellar, 227
Ni
solar, 156
spectra, 488
Noble gases
in counters, 394
Nodal stability, 483
Noise
in image intensifiers, 2
Noise temperature
radio, 322
Nongray atmosphere, 356
Nonhomologous contraction, 368
Nonlinear interactions, 169, 186
interstellar galactic structure, 170
Nonlinearity
of solar models, 160
Nonradiative flux
solar, 159, 160

Nonrelativistic approximation
atomic transitions, 451
Nonseparable wavefunctions, 456
Nonthermal radiation, 170, 184, 187
Nonthermal velocity
solar, 156
Normalization
atomic transition wavefunctions, 472-73
Normalized correlation, 22
Normalized transmission, 115
North Pole Survey, 252, 257
Nova shells, 71
N stars, 230, 231
N-type galaxies, 259, 425, 444
Nuclear region
of galaxy, 165, 330
as radio source, 202, 444
Nuclear spin-induced radiation, 492
Nuclear spin perturbation, 490
Nuclear synthesis, 197
Nuclear track emulsions, 3
Nucleation free energy, 230, 232
Nucleon density
Universe, 198
Nucleon destruction rate, 204
Nucleus
of comets, 267, 275, 277, 278, 279
condensation, 231
Number-flux density relation
for radio sources, 251, 255
Numerical integration
planetary orbit, 309, 313
Numerical solution
Hartree-Fock, 464

O

O
abundance, 226, 232
interstellar, 177, 183, 226
sequence, 474
in Wolf-Rayet stars, 43, 58
X-ray absorption, 378
Oberon, 291
Objective-prism spectra, 52
Objective-prism spectrophotometry, 216
Obliquity
orbital, 289, 296, 316, 318
Obscuration
interstellar, 216, 224
Occultation
curves, 33
of stars, 13, 323
of sunspot, 119
Oceans
tidal friction, 291-98
Of stars, 43, 48
OH
in comets, 267, 268
emission, 321, 417, 419
interstellar, 234
OH^+ in comets, 268
Ohmic dissipation, 162
Old novae, 353
X-ray source, 413
One-configuration approximation, 451-54
One-electron wavefunctions, 452
One-layer approximation
of solar atmosphere, 160
One-mile telescope, 250, 255
Oort-van de Hulst distribution, 236
Opacity
comets, 267
solar, 156, 158
white dwarf, 363
Open clusters
extinction, 216
Optical bandwidth, 22, 23, 24
Optical depth, 155, 157
interstellar, 227
interstellar medium, 174
radio source, 342, 422, 433-34
solar monochromatic, 140
umbra, 152
Optical fields, 15
Optical transition, 209
Optical variability
quasi-stellar objects, 144, 419
Optics
interstellar grains, 235-39
Orbital acceleration
planetary, 289
Orbital parameters, 295, 301, 307
comets, 270, 271
Orbitals
atomic, 453
Orientation
comets, 86, 268, 270-78, 281, 285
planetary axes, 290, 299
Orion
arm, 168
nebula, 10, 172, 224, 321
reddening, 216, 223, 235
"stage," 71
Orthicon storage target, 1
Oscillation
interplanetary medium
particles, 241
solid-body, in planets, 291, 293
Oscillator modes
in solar atmosphere, 160
Oscillator strength, 451
absorption, 209
for transition, 141
OSO I, 120
OSO-4, 398
O stars, 41, 51, 53, 216, 229
Outer Sword Region, 223
Outgassing
in electronic cameras, 2
Overlap integrals
atomic spectra, 453
Owens Valley Observatory, 419

P

Pair production, 202
Palomar observations, 11
of comets, 285
of stars, 352
Parabolic radio telescopes, 421
Paraboloidal mosaics, 26
Parallax, 26
spectroscopic, 220
trigonometric, 351-52
Paramagnetic grains, 240
Parametric amplifiers, 322
Paris Observatory, 2
Parity, 461
Parkes survey, 252, 253, 254, 324, 335, 424, 426
Particle injection, 340
in radio sources, 338
Particle streaming, 81, 96, 127, 132, 133
interplanetary, 125
Path difference
in interferometer, 19
Pattern velocity, 174
Peculiar galaxies
X-ray observations, 413
Pencil-beam instruments, 252, 255, 257
Pendulum equation, 300, 309
Penumbra, 135, 136, 148, 151, 152, 155, 161
sunspot, 118, 119
Perfect gas, 363
Performance characteristics
of image intensifier, 1
Pericenter, 307
Perihelion, 298
comet, 267, 281, 282
Period
rotation, planetary, 288, 289, 290, 291, 298
Periodicity

radio variations, 440
solar activity, 105, 120
Periodic table, 462
Permitted transitions, 450-88
Permutation operator, 452
Perrine comet, 279
Perseus, 217
reddening, 216, 217, 221, 222, 223, 224
Perseus arm, 168, 224
Perseus cluster, 330
Perturbation expansion, 464, 467
Perturbations
of planetary orbits, 308, 310
of spiral structure, 169
Perturbation theory
atomic spectra, 456-57
Petschek mechanism, 189
Phase function, 230, 239
Phase lag, 295, 304
Phase velocity, 82
Phosphor output tubes, 2, 4-7
Phosphor-photocathode, 1
sandwich, 1
Photocathode efficiency, 2
Photodissociation
in comets, 268
Photoelectric detectors, 23, 398-99
Photoelectric effect, 281
Photoelectric guiding, 26
Photoelectric observations
of comets, 280
interstellar, 230, 243
solar, 136
Photographic observations
solar, 136
Photoionization
in comets, 277, 278
of intergalactic medium, 199
Photometers, 318
Photometric observations
classification using, 44-45
comets, 268
Photometry
and reddening, 216
Photomultipliers, 26, 27
for image intensifiers, 2
Photon spectrum
cosmic, 200
Photopion production, 202
Photosensitive detectors, 2
Photosphere
magnetic fields, 83, 88, 91, 92, 94, 111, 125-26
solar, 115, 118
temperature, 128, 129, 138, 139, 141, 142, 146, 150, 153, 155, 156, 162
Photosurfaces, 1
Pic du Midi, 10
Pioneer 5, 84, 90
Pioneer 6, 100, 101, 102, 104, 106, 107, 108
Pion production, 202
Pitch angle, 169, 172
Plages, 117, 118, 119, 120, 121, 122, 126, 127, 130, 556
Planck function, 241
Plane-parallel model
for solar atmosphere, 150
Plane polarization
of solar atmosphere, 151
Planetary images, 10
Planetary nebulae, 8, 39, 40, 367, 369
Planets
rotation, dynamics, 287-318
Plasma
interplanetary, 270
primeval intergalactic, 200
Plasma emission, 273
Plasma flow, 79, 276
Plasma frequency, 205, 341
Plasma instability
interplanetary medium, 105
in radio sources, 340
Plasma oscillation, 211
Plasma velocity, 84, 85, 90, 125
Plasma waves, 186, 203
Plate magazines, 2
Platt particles, 215, 226, 232-33, 237, 240
Pleiades, 182
white dwarfs, 351
Pluto
rotation, 287, 290, 315, 316
Pointing accuracy, 388
Poisoning
photocathode, 2
Polar fields
solar, 132
Polarimetric observations, 268
Polarity
intergalactic medium, 83, 92, 93, 99, 101
magnetic, 119, 125, 128, 150
solar, 118, 124
Polarity interface, 181
Polarizability
interstellar particles, 239
Polarization, 336, 342, 426-27, 432, 436
interstellar, 169, 227-28, 237-38
θ^2 Ori, 224
in radio sources, 347, 418, 420
ultraviolet, 224
X-ray, 373
Polarization curve
graphite, 238
Polarization plane, 177
interstellar, 167
Polarized light
from Sun, 115
Polaroid
in telescope system, 227
Polar radius, 30
Polyatomic gases
quenching, 394
Population I, 39, 73-74
Population II, 369
Population function, 141, 142
Population law
radio source, 333
Pores, 137, 150, 158, 159
sunspot, 136
Position angle
comet tail, 270
Po spectra, 488
Power index, 397
Power-law spectrum, 321, 326, 327, 328, 329, 333, 338, 341, 431, 432, 442
of electron energy, 422
photon spectrum, 201
X-ray, 377
Power spectrum, 19
Praesepe
white dwarfs, 351
Precession
orbital, 290
Predissociation, 232
Preformed photocathodes, 2, 4
Preionization, 355
Pressure distribution
solar, 138
Pressure excess
in white dwarfs, 354
Pressure gradient
solar, 138-39
Primary X-ray spectrum, 378
Primeval abundances, 197
Primordial nebula, 315
Primordial rotation
solar system, 291, 311, 312, 315, 316, 317
Principal moment of inertia, 299
Principal quantum number, 455
Principle of nodal stability, 483
Probability
capture, 301-7, 312-15
and statistics, applied to solar activity, 115-34
Probability amplitude, 455
Procyon B, 353, 354
Prograde spin, 307, 314

Proper motion
of quasi-stellar objects, 258
of stars, 39, 351, 352
Proper time
Proportional counter, 392-98
Protoclusters, 190
Protogalaxies, 190
Proton flare, 122, 127, 131
Proton-proton collisions, 202
Protoplanets, 316
Pulsation
image, 136
stellar, 36, 230, 368
Pulse-height distribution
counter, 395
Pulse shape discrimination, 400-2
Pumping systems
for image intensifiers, 3
Pure coupling schemes, 453
Pygmy stars, 351
Pyrometers, 24

Q

Quadrupole moment
planetary, 310
Quantum defect method, 473
Quantum detectors
X-ray, 374
Quantum efficiency, 3, 4, 6, 23
Quarts grains
interstellar, 233
Quasi-metallic particles
interstellar, 237
Quasi-molecules, 234
Quasi-stationary fronts, 180
Quasi-stationary structure
spiral, 169
Quasi-stellar radio sources, 9, 249, 258, 321, 322, 334, 335, 338, 341, 343-46, 418, 419, 423, 425, 440, 443, 444
extragalactic, 188, 195, 206
Quenching gases, 394

R

Radar astronomy
planetary, 287, 288, 317
Radial integrals, 453, 469-81
Radial pulsation, 37
Radial wave equation, 471
Radial wavefunctions, 453
Radiant power gain, 5
Radiation-dominated universe, 200-3
Radiation pressure
in comets, 276, 279, 284
interstellar, 188, 231
Universe, 200
Radiation temperature
solar, 146
Radiative association, 233
Radiative decay, 209
Radiative equilibrium, 145, 147
Radiative recombination, 232
intergalactic medium, 199, 207, 209
Radio frequency flux
solar, 120, 121
Radio-luminosity distribution, 253
Radiometer systems, 421
Radio sources
counts, 249-64
interplanetary, 432-45
observations, 419-32
spectra, 321-50
variable, 417-45
Radio telescopes, 251, 323, 421
Rapid rotators, 30
Rate constants
C-H system, 232
Rayleigh-Jeans law, 341
Rayleigh-Taylor instability, 166, 181, 183, 185, 187, 191
Ray tracing studies, 404
Receivers
radio, 252, 254, 323
Reception pattern
radio, 252
Recession velocity, 200
Recombination lines
in gaseous nebulae, 321
interplanetary, 207
interstellar, 176, 232
Wolf-Rayet stars, 69
Recurrence pattern
of interplanetary sectors, 127
Recurrence period, 83, 101, 105
Recurrent magnetic storms, 125, 126, 128, 130
Reddening
independent parameters, 44
interstellar, 215, 221
law, 216
Redshift
cosmological, 96, 200, 206, 212
gravitational, 342
of radio sources, 249, 253, 259, 262, 429, 440, 443, 444
of solar spectral lines, 153
of stars, 352
Reduced transition integrals, 476-77, 478
Reduction errors
comet observations, 271
Reflection coefficient
X-ray, 408
Reflection nebulae, 229
Reflection spectrum
comets, 268
Reflective detectors, 2
Reflectivity
radar, 288
Refraction by ionosphere
radio, 321
Refractive index, 341
interstellar grains, 233, 235
Refractory core
interstellar particles, 246
Refrigeration
of electronic camera, 2
Relative abundances, 226
Relative particles, 330, 337
in radio sources, 435
in Universe, 198
Relative transition probability, 486-92
Relativity, 195
Relaxation time
temperature, 178
Relay lens, 5
Residence time
of atom on grain, 233
Resolution
radio, 251, 423
for solar observations, 139
Resolution limit
electronic camera, 2, 4, 6
Stratoscope, 137
Resolving power
of interferometer, 19, 33-34
radio, 255, 322
Resonance amplification, 166
Resonance distribution modes
interstellar medium, 166
Resonance lines
intergalactic, 206
Resonance points
spiral structure, 169
Resonances
of the first kind, 298-307, 317
of the second kind, 307-15
Resonant angular velocity, 300
Resonant rotation, 287, 298-314, 317
Resonant spin, 298, 300, 302
Response function
angular, 390-91
Restoring torque, 300, 301, 310
Retrograde comets, 271, 272
Retrograde rotation

planetary, 287, 288, 289, 309, 311, 316, 317
Reversal of solar fields, 124
Revolution period
planetary, 292
Ricci tensor, 195
Rigid body dynamics, 383
Rigidity
planetary, 292, 293
radio telescopes, 322
Rigid rotation
of interplanetary structure, 100
Ring nebulae
and Wolf-Rayet stars, 46
Rise time, 401
Robertson-Walker metric, 342
Roche limit, 75
Roche surface, 369
Rocket observations
of comets, 267
radio, 322
reddening, 218
X-ray, 374, 382, 393, 402
Rotational characteristics
solar system, 287-318
Rotational parameters, 382
Rotational shedding, 369
Rotation curve
galaxy, 165
Rotation period
solar, 120
Round collimators, 386
Rowland circle, 409
Royal Observatory, Edinburgh, 216
R-type front, 180

S

Sacramento Peak Observatory, 149, 153, 163
Sa galaxies, 167
Sagittarius arm, 165, 168
Sagittarius-Scorpius region, 389
X-ray observations, 410
Saha equation, 200
Saha factor, 141
Satellite observations
of comets, 267
interplanetary medium, 79, 83, 84, 100
radio, 322
solar, 126
Satellites
artificial, 293, 311
natural, 287, 290, 291, 295, 307, 315, 317, 318
X-ray observations, 373
Saturation
formation of grains, 230
of spectral line, 142
Saturation characteristics
Geiger counters, 396
Saturn, 10
rotation, 290, 295
SBa galaxies, 172, 173
SBb galaxies, 172
SBc galaxies, 173
SB galaxy, 172, 173, 174, 184
Scalar curvature, 195
Scale factor
expansion, 195-96
Scale height
stellar, 354
Scanning electron beam, 1
Scanning spectrometers, 218, 243
Scanning technique
for solar observations, 139
S1 cathode, 2, 4, 10
S9 cathode, 2, 4
S11 cathode, 2, 4
S20 cathode, 2
Scatter diagrams
magnetic activity, 96
Scattering
instrumental, 135, 136, 141
interstellar medium, 220, 229, 230
Scattering calculations
in atomic spectra, 459
Scattering diagram, 230
Scattering pattern
X-ray, 383
Sc galaxies, 167
Schmidt telescope, 216
Schwarz inequality, 475
Scintillation, 17, 19, 23, 29, 35
Scintillation counter
X-ray astronomy, 382, 399-400
Screened Coulomb approximation, 460
Screened-hydrogenic approximation, 475-77
Screening
atomic, 460
Screening function, 470
Screening parameter, 468
SC storms, 80
Sealing
of photocathodes, 2
Secondary calibration sources, 328, 329
radio, 327
Secondary emission dynodes, 1
Second harmonic deviation, 296
Second-order coherence, 15
Sector structure, 79, 92-111, 124, 126, 127, 128, 130
Secular acceleration
Moon, 293
solar, 289
Seeing, 148, 150, 151
and interferometer measurements, 20
and solar observations, 139
Seismic data
and natural oscillations, 293
Selection effects, 324, 325, 330, 335, 365
intergalactic medium observations, 175
radio observations, 250
Selection rules
atomic transitions, 457
Selective absorption, 141
Self-absorption, 334, 335, 341, 342, 343, 346, 347, 440
Self-consistent density waves, 170
Semiempirical methods, 355
Semitransparent detectors, 2
Sensitivity
detector, 31, 36
emulsion, 6
radio telescope, 251, 254, 255, 323
Sensitivity range
infrared spectrometer, 218
Servocontrols, 20
Seyfert galaxies, 259, 330, 425, 429, 442, 444, 445
radio emission, 419
Sϕ galaxies, 179
Shear stress
planetary, 311
Shell-burning stars, 367, 368
Shell sources
radio, 423
Shielding
X-ray, 395
Shock transition, 278
Shock-tube techniques
for f values, 486
Shock waves
interplanetary, 80, 84, 110, 111, 278
interstellar medium, 165, 173, 180, 182, 183, 185
Short-period binary, 47
Shot noise, 21
Sidelobes
radio observations, 252
Sidereal period, 288, 289
Signal-to-noise ratio, 23, 24, 26, 34, 322, 324
radio, 254
Signal-generating tubes, 1
Silicon
interstellar, 177

X-ray lines, 378
Similarity solution, 183
Sirius, 26, 31
Sirius B, 353, 354, 369
Six-color system, 220
Sky brightness
measurements, 229
Slater integrals, 486
Slit collimator, 385
Slitless spectrograms, 52
Slitless spectrometer
X-ray, 409-10
Slowly varying component, 128, 417
S numbers, 2
Sodium D_2 emission
comets, 275
Soft X rays, 394
detectors, 381
Solar activity, 80, 82, 96, 115, 134
Solar cycle, 101, 121, 123, 131
Solar flares, 179
Solar gravity, 275, 279
Solar neighborhood
reddening, 225
Solar plasma, 84, 98, 272, 278, 281
Solar telescopes, 135
Solar tower, 11
Solar wind, 130, 132
and comets, 267, 268, 270, 271, 272, 277, 278, 281, 285
and interplanetary medium, 79, 82, 84, 87, 88, 98, 105, 111
Solenoids
for magnetic focusing, 4
Solid-angle dependent background, 388
Solid-body motion
of comets, 267
Sonic point, 281
Soot particles
interstellar, 237
Sounding rockets, 229
X-ray observations, 373, 391
Source parameters, 387
Southern Milky Way, 168
Spatial resolution
solar observations, 118
Spectracon, 4
Spectral classification, 220
by photometry, 44
Spectral curvature, 325
Spectral density function
of interplanetary magnetic field, 106
Spectral index, 45, 256, 257, 325, 326, 328, 329, 330, 333, 340, 347, 422, 423, 425, 432, 439
Spectral lines
solar, 115, 118, 140-41
Spectral parameters, 383
Spectral purity, 218
Spectral resolution, 397
Spectral response, 7
cathode, 2
Spectral shape
intergalactic, 204
Spectral types
and extinction, 216
Spectrograms, 140, 146, 149, 153
solar, 135
Spectroheliogram, 11, 116, 117, 118, 119
Spectrometers
scanning, 218
Spectrophotometry, 3, 216, 235
Spectroscopic binary star, 8, 13
Wolf-Rayet, 42, 49, 72-73
Spectroscopic observations, 275, 281, 285
comets, 267
Spectroscopic parallax, 220
Spectroscopy
image tube, 7-9
Spectrum, 254
photon, cosmic, 195, 200-3
radio, 432
Specular density
of emulsion, 3
Spin
in atomic spectra, 467
Spin-orbit interaction, 390
Spin stabilization, 383
Spin states
of planets, 287, 295, 298
Spin temperature, 206
Spiral arms
galactic, 165, 167-74, 179, 203, 224, 225
Spiral branches, 166
Spurious emission
in image intensifiers, 4
Sputtering, 233, 234
S spectra, 328
Stability, 143
cathode, 4
comet structure, 274
counter, 394
planetary rotation, 296-301, 305, 307-12, 315
Rayleigh-Taylor, 166
solar active regions, 119
stellar, 366, 368
Wolf-Rayet stars, 75
Stability index, 482
Stabilizing transitions, 233
Stable resonance, 301
Stagnation point, 278
Stainless-steel collimators, 385
Standard deviation
spectral index, 333
Standard noise source, 323
Standard source, 323
Standard stars, 41, 42
Standing bow shock
of Earth, 278
Standing waves
in solar atmosphere, 160
Standoff distance, 278
Star camera
in rocket, 382
Star counts
and interstellar obscuration, 216
Star-field photography, 9-10
Star formation, 166, 179, 180, 181
Stark broadening, 67
Stark effect, 362
Star sensors, 402
State vector, 452
Static equilibrium, 171
Static models
for stars, 367
Static solution, 82
Static universe, 252, 253, 257
Statistical fluctuation, 21
X-ray observations, 374, 387
Statistical weight
of atomic state, 141
Statistics
and interplanetary fields, 124
of radio source counts, 250, 251
of solar active regions, 115-34
spectral, 325, 330
Steady-state conditions
intergalactic, 207
Steady-state cosmology, 201, 258, 261
Stellar associations
extinction, 184, 216
Stellar atmospheres, 13
element abundances, 197
and interstellar medium, 233, 237
white dwarf, 353, 355-58
Wolf-Rayet, 68-69
Stellar diameters
measurement, 13-33
Stellar fields, 191
Stellar formation, 216
Stellar images, 136
Stellar interferometer, 15
Stellar masses
white dwarfs, 353-54
Stellar nucleosynthesis, 197

Stellar winds, 187, 191
Steward Observatory, 10
Stimulated emission
radio source, 443
Stopping power, 205, 211
Storage target
orthicon, 1
Storms
solar, 417
Straight spectra, 328, 346, 347
Strain amplitude, 294
Stratification
planetary, 313
of stellar atmospheres, 197
Stratoscope II, 218
Stratoscope observations, 136, 137, 154
Strength
transition, 451
Striation
in comets, 283
in interstellar medium, 216
in solar structure, 137-38, 155
Strong coupling, 312
Subcosmic ray, 179
Subdwarfs, 359
Subhydrostatic pressure, 140, 143, 144, 158
Subshells
atomic, 459
Subsonic solution, 281
interstellar, 170
Subtraction errors, 388
Sudden commencement storms, 80, 92
Sulfur X-ray lines, 378
Sun
active regions, 115-34
and interplanetary medium, 79
radio emission, 417
rotation, 289, 308, 312
Sun-grazing comets, 285
Sun sensor, 382
Sunspots, 115, 118, 121
cycle and radio observations, 322
spot groups, 122
Supergiants, 29, 73, 219, 221, 222, 223
Supergranulation, 115, 116, 117, 118, 138, 162
and intergalactic structure, 105
Supernovae, 171, 184, 369
Supernova remnants, 321, 337, 346, 417, 419, 421, 423, 433
shocks, 165, 183, 185, 187
X-ray observations, 376, 377, 413
Supersaturation
and formation of grains, 231
Supersonic solar wind, 111
Suprathermal component, 195, 207
Surface brightness, 343
comets, 267, 282
limiting, 341, 344
Surface gravity
planetary, 292
white-dwarf, 354, 356, 360
Surface temperature
of comets, 267, 281
Synchrones, 280, 281, 282
Synchronic band structure, 283, 285
Synchronic formation
comet tails, 279
Synchronous rotation, 287, 288, 291, 298, 301, 307, 311, 318
Synchrotron losses, 338-40
Synchrotron radiation, 263, 321, 329, 334, 335-36, 345, 432, 439, 440, 441, 443
interstellar, 167, 170, 177
Jovian, 290
radio, 418
X-ray, 378, 397
Syndynames, 280, 281, 282
Synodic mean motion, 307, 309, 314
Synoptic charts, 125, 129
Systematic errors, 251
in radio astronomy, 323, 421

T

Tail rays
comet, 273, 274, 276
Tangential discontinuity, 105, 106, 110
Taurus-Auriga-Orion clouds, 46
Taurus cloud, 225
Taylor column, 315
Teflon windows
in counters, 398
Telemetry
of signals for image intensifiers, 2
Television camera tubes for intensifiers, 1
Temperature
electron, 207
intergalactic matter, 199, 207
photosphere, 137
solar, 117
Temperature gradient
solar, 143
Temperature inversion
solar, 145, 147
Temperature relaxation, 178
Temperature scale
stellar, 18
white-dwarf, 355-58
Temporal signature
of magnetic storm, 80
Tensor equations
of relativity, 195
Terminal velocity
in comets, 281
Terrestrial activity
magnetic, 93, 95, 111
Terrestrial planets, 301
rotation, 293, 294
Thermal barrier, 212
Thermal conductivity
interstellar medium, 178
Thermal distortion
of radio telescope, 421
Thermal equilibrium, 175, 176
Thermal instability, 177, 178, 190
Thermalization, 205, 278
Thermal models
planet, 311
Universe, 198, 207
Thermal radiation
in nebulae, 321
Third Cambridge Catalogue, 249
Thomas-Fermi potential, 486
Thomson scattering, 262, 336
Three-degree background, 250, 263
Threshold energy
for lattice release, 234
Tidal forces
interstellar, 165
Tidal frequency, 296
Tidal friction
effect on rotation, 287, 289, 291-98
Time dilation, 200
Time resolution, 396
Titania, 291
Torque, 86, 293, 294, 295, 300, 304, 308, 311, 312, 317
tidal, 291, 313, 314
Torsional oscillation, 315
Transfer lenses, 5, 6
Transition amplitude, 452
Transition integral, 453
Transition matrix, 451
Transition probabilities
atomic, 449-92
Transition screening parameter, 477

Transmission
atmospheric, 135
Transmission function, 382
Transmission losses, 5
Transmission-secondary emission, 6, 7, 9
Transverse fields, 117, 149, 150, 159
Transverse wavemodes, 105
Trapezium, 172
reddening, 223
Traveling-wave tubes, 322
Triangular response, 386
Trigonometric parallax, 351
Triton, 290, 295, 315
Tropospheric absorption
radio, 322
True anomaly, 299
Tsitovich effect, 341
Tubes of force
interstellar, 167, 173, 188
solar, 162
Turbulence
interstellar, 186, 190
Turbulent stress, 313
Turbulent velocity
solar, 156
Turnoff point, 75, 369
Turnover
spectral, 380
Two-arm spirals, 169
Two-color diagram, 44, 352, 358, 360, 362
Two-electron atom, 450, 457
Two-fluid medium, 83
Two-quantum transitions, 492
Two-sequence hypothesis, 364
Two-stage cascade tube, 5
Type I comet tail, 81, 267, 270, 271, 277, 279
Type II comets, 268, 270, 279, 281, 285
Type III comets, 279
Type I supernovae, 183
Type II supernovae, 179, 183, 369, 442

U

UBV system, 216, 225, 351, 355
white dwarfs, 359, 360
and Wolf-Rayet stars, 48, 56
Ultrarelativistic particles
radiation from, 418
Ultraviolet
Al II region, 232
intergalactic, 203
solar, 120
Ultraviolet dwarfs, 365
Ultraviolet excess, 73
of Wolf-Rayet stars, 56
Ultraviolet extinction curve, 218
Ultraviolet polarization
σ^2 Ori, 224
Umbra, 135, 136, 137, 138-39, 140, 141, 142, 144, 145-46, 148, 152, 153-54, 162
sunspot, 119
Umbral dots, 146-47, 158, 161
Umbral granulation, 137
Uniform model
Universe, 190
Unipolar magnetic region, 124, 127
Unitary matrices, 454
Unit tensor, 452
Universe
anisotropy, 190
intergalactic matter, 195-96, 198
and radio sources, 249, 261, 264
University of California
X-ray observations, 400
Uranus
rotation, 290, 316

V

Vacuum lock, 3, 4
Valence electron orbitals, 459
Valve system
in electronic camera, 2, 3
Van Gent comet, 282
Variability
of radio sources, 259, 322, 326, 338, 340, 345, 347, 417-45
of Wolf-Rayet stars, 46-48
of X-ray sources, 377
Variable stars, 231
Variance, 387
Variational calculations, 457
Variational screening, 484
Variation principle, 451
Vehicle guidance
for rockets, 403
Vela satellite program, 86, 87, 108, 111
Velocity cells
solar, 116
Velocity dispersion
interstellar, 170
Velocity fields
solar, 138, 148, 153-56
Velocity integral, 469
Venus, 84, 316
rotation, 287, 288-89, 291, 294, 295, 307-15
Vernier effect, 391
Video signal
for image intensifier, 2
Vignetting, 404
Violet shift
of solar spectral lines, 153, 155
Virgo cluster, 206
Virtual excitation
atomic, 465
Virtual states, 462
Viscosity, 185
Viscous stress, 313
Visual binaries, 8
Vortex structure
solar, 118
Vulpecula
reddening, 216

W

Wall effects, 394
Water-vapor absorption
of radio source, 322
in stars, 219
Wavefunctions
atomic, 450
Wavelength-dependent absorption, 216
Wavelength limit
of radio telescopes, 421
Wavelength resolution
Bragg spectroscopy, 408
Wave reflection, 185
WC stars, 41, 53
Weak coupling, 312
Weak-interaction neutrino processes, 365
Weighting function, 141
White dwarfs
oscillating, 351-70
as radio source, 418
White-light photograph, 148, 153, 159
solar, 136-37
Whittaker function, 472
Wideband filters, 21
Wiener-Kintchine theorem, 19, 23
Wigner-Eckart theorem, 453
Wilson depression, 138, 152, 155, 157, 158, 159
Wilson effect, 138, 156
Winding
of spiral arms, 168, 169
Window tube, 4
Wire-grid collimator, 381
X-ray detector, 388-92
WN stars, 40, 41
Wolf-Rayet stars, 39-76

X

Xenon in counters, 396

XM emulsion, 4
X-ray absorption coefficient, 378
X-ray astronomy, 195
  solar, 120
  techniques, 373-414
X-ray diffraction, 17
X rays
  and radio sources, 262, 343
X-ray sky, 375
X-ray sources, 9
X-ray spectrum
  intergalactic, 203
X-ray telescope, 403-10

Y

Yerkes Observatory, 9
Young radio sources, 340, 436
Young stars, 172, 216
  in Galaxy, 203
  spiral arms, 167, 180
  Wolf-Rayet, 39-76

Z

Zanstra theory, 69
Zeeman effect, 188
  interstellar medium, 170
Zeeman photographs
  solar, 115, 116, 148, 149
Zernike-van Cittert theorem, 16
Zero age-main sequence, 49
Zero-field region
  interstellar, 181
Z expansion, 460-72
Zodiacal light, 81
Zone of avoidance, 46